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THE BACTERIOPHAGE: ITS PROPHYLACTIC AND THERAPEUTIC VALUE*

A REVIEW

By E. W. SCHULTZ, M. D.
Stanford University

THE discovery of bacteriophagy by d'Herelle¹ in 1916 marks the beginning of one of the most important epochs in the history of bacteriology, not only because of its theoretical, but probable practical bearing. In August of that year there came to the hospital of the Pasteur Institute an adult suffering with a severe form of Shiga dysentery. During the course of the patient's illness d'Herelle made bouillon cultures of the stools daily. These cultures were incubated overnight and filtered through a Chamberland filter. A few drops of the filtrate was then added to a young bouillon culture of dysentery bacilli and the mixture placed in the incubator. Throughout the course of the disease the tubes so prepared yielded normal cultures of dysentery bacilli. One morning, however, the tube prepared on the previous day was found to be sterile. At the same time it was learned that the condition of the patient had greatly improved. The sterile tube was filtered and a few drops of the filtrate was added to a fresh suspension of dysentery bacilli and placed in the incubator. In about ten hours this tube also became limpid. A few drops of the filtrate of this lysed culture induced complete clarification of the third suspension, and so on indefinitely in series. In other words, the lytic principle was regenerated with the dissolution of each culture.

On spreading a suspension of Shiga bacilli, to which a little of the filtrate had just previously been added, on an agar surface, d'Herelle noted after incubation the presence of a number of small, circular, clear areas in an otherwise uniform turf of bacterial growth. These d'Herelle ascribed to the deposition of corpuscles of the lytic agent present in the mixture which he had spread on the agar surface. He believed that the original corpuscles deposited on the surface had parasitized and dissolved the growing bacteria in their immediate vicinity and that the clear areas actually represented colonies of the lytic corpuscles. The number of the clear areas varied with the quantity of the filtrate added to the bacterial suspension. D'Herelle concluded that the phe-

nomenon must be due to an invisible parasite of the bacteria and he accordingly gave it the name "bacteriophage."

FURTHER OBSERVATIONS CONCERNING THE BACTERIOPHAGE

These observations stimulated d'Herelle² and a host of other investigators to a further study of the phenomenon as is evidenced by the fact that about seven hundred papers have since appeared. It is obvious that an adequate presentation of even the main facts is out of the question in the brief time at my disposal. I shall therefore confine myself to such introductory remarks as appear essential for a satisfactory understanding of the principle theme which is to follow.

Following the isolation of a bacteriophage active on dysentery bacilli, d'Herelle² isolated in rapid succession races active on a number of other species of bacteria, including *B. coli*, *B. typhosus*, *B. paratyphosus* A. and B., *B. gallinarum*, *Pasteurella bovisepitica*, *Pasteurella pestis*, *Vibrio cholerae*, etc. Races active on staphylococcus and streptococcus and several other species have been added by other investigators.

With few exceptions these races have all been isolated from the feces of man and animals, particularly from convalescents, and from water and soil. Indeed, according to d'Herelle every animal and every man harbors a bacteriophage in symbiosis with *B. coli* or other species of the normal intestinal flora. In the event of an invasion by a pathogenic bacterium the bacteriophage normally present gradually acquires a virulence for the invader and brings about its elimination after the virulence has attained a certain level. Some investigators question its habitual occurrence in normal animals and men, but this difference of opinion may be due, as d'Herelle has pointed out, to defective procedures in making the isolation. This is, however, a minor point so far as the purpose of this paper is concerned.

Of considerable importance, however, is a full recognition of the fact that different races of the bacteriophage may differ widely in their virulence for a given bacterium. Moreover the virulence of a given race may differ appreciably for the different bacteria attacked. For some species the virulence may be marked, for others it may be of a low grade, but when the virulence for a given bacterium is low it may generally be greatly increased by serial passage on the organism. On the other hand, the virulence of the bacteriophage may be attenuated by applying appropriate heat,

* Read before the Santa Clara County Medical Society, March 16, 1927.

and in other ways. It is not necessary, for the purpose of this paper, to explain this difference in the virulence. D'Herelle regards it as the response of a living body. Other explanations have, however, been offered in the literature.

On the part of the bacteria there also appear to be certain fixed differences with regard to the phenomenon. Certain species, like *B. dysenteriae* and *B. pestis*, appear to be homogenous with regard to their susceptibility to 'phage action, that is, a race of bacteriophage virulent for one strain of the species shows itself virulent for all other strains of that species. On the other hand, such species as *B. typhosus* and *S. aureus* are clearly heterologous with regard to their susceptibility, certain strains may prove to be susceptible, whereas other strains resist the particular bacteriophage. It should, however, be added that insusceptible strains may prove susceptible to another race of bacteriophage.

Another form of bacterial resistance to 'phage action is that which apparently results from a reaction to the bacteriophage, an acquired immunity which follows exposure to a bacteriophage, particularly one of low virulence. Bacteria which survive the lytic action of the bacteriophage subsequently reclothe the culture medium, and such reclothing is referred to as a "secondary culture." With a weak 'phage, secondary cultures appear promptly and with regularity, whereas with a highly virulent 'phage the lysed culture may remain clear for weeks. It is significant that these resistant forms seem to possess the faculty of attenuating the bacteriophage corpuscles exposed to them. Indeed, according to d'Herelle and Flu the bacteriophage may actually be destroyed as a result of such exposure. As a rule, however, an equilibrium seems to be established, so that virulent corpuscles and resistant bacteria are found to coexist in the subsequent transfers to fresh bouillon. On solid media, only a portion of the colonies may be found mixed with 'phage, the remainder being free of the contamination. Of the latter some may prove resistant to 'phage action, while others may prove susceptible. The resistant, 'phage-free, colonies may, however, lose the acquired property after a number of generations on artificial media. It is clear, therefore, that a study of the phenomenon involves a consideration of *two* variables, the bacteriophage and the bacterium.

PROPERTIES OF THE BACTERIOPHAGE

Something should be said regarding the properties of the bacteriophage. It is generally held now that the bacteriophage is of corpuscular nature. Indeed its size has been estimated to be about 20 to 30 uu. According to one investigator it is of about the same dimension as the virus of vaccinia and of rabies. Regarding its composition nothing is known. Most races seem to resist the action of trypsin. I have, however, found two races of anti-staphylococcus bacteriophages which are inactivated by trypsin within forty-eight hours. Others seem to resist its action indefinitely. The bacteriophage is more resistant to heat than are vege-

tative forms of bacteria. The temperature of inactivation seems to be related to the degree of virulence. Some impairment of the activity is said to appear at 45C., but at about 75C. complete inactivation results in thirty minutes, whatever the race or degree of virulence.² It is also more resistant to chemical agents than are vegetative forms of bacteria. It may retain its activity in filtrates over a period of years, though the corpuscles are said to diminish appreciably during this time. Injected repeatedly into the animal body the bacteriophage gives rise to an antiphagic serum, which is capable of exercising a definite inhibiting action on the phenomenon.

D'HERELLE'S VIEW OF THE BACTERIOPHAGE

Despite the extensive studies on the nature of the bacteriophage, widely different views are entertained by investigators. It is out of the question to deal even briefly with the theories which have already been advanced. D'Herelle holds that it is a living virus parasitic on bacteria. He bases this hypothesis on the evidence (1) that the bacteriophage is an autonomous body foreign to the bacterium, at the expense of which it multiplies; (2) on the ground that the multiplication of an autonomous body implies the power of assimilation, a *criterion of life*, and (3) on the ground that the bacteriophage possesses powers of adaptation, another *criterion of life*. But, as I have indicated, a number of other hypotheses have also been advocated, and in which the bacteriophage is for the most part explained as either a living or non-living principle, of one sort or another, derived from the substance of the bacteria themselves. A consideration of these theories would in itself require an evening. As a matter of fact, from the standpoint of its possible practical bearing, it really makes no difference whether the bacteriophage is animate or inanimate; a product of the bacteria, or in reality a parasite foreign to them. Its nature can only be of academic interest and may not, like the nature of anaphylaxis, be definitely settled for a number of years to come.

Of considerably more importance from the practical standpoint are studies of the rôle the bacteriophage may play in recovery from disease and in checking epidemics. According to d'Herelle, the outcome of a bacterial infection probably depends on the rapidity with which the bacteriophage naturally present in the intestine acquires a virulence for the invading organism. Under favorable conditions a rapid adaptation on the part of the bacteriophage results in an early elimination of the pathogenic organism after only a few mild symptoms, or no symptoms at all. Under less favorable conditions the acquired virulence appears later and there is a proportionate delay in the abatement of the disease symptoms. At any rate, a potent bacteriophage is said to make its appearance simultaneous with the onset of convalescence. Moreover the bacteriophage does not remain confined to the intestinal tract, but, as has been shown by several investigators, may pass into the circulation and so reach affected tissues lying outside of the alimentary tract. In other words, although this latent defense resides

in the intestinal flora, once aroused, its activities may extend to distant tissues in the body.

Moreover, according to d'Herelle, the virulent bacteriophage eliminated in the feces of the convalescent may be in turn ingested by normal individuals living within the zone of an epidemic and so convey a timely protection to otherwise susceptible individuals. In other words, he holds that this particular type of immunity, like the disease itself, is infectious in character. "The epidemic ceases at the moment when all susceptible individuals harbor a bacteriophage active for the causative organism of the epidemic. Either the bacteriophage has acquired a virulence in the body of the individual who harbors it, or this individual has been 'contaminated' by a bacteriophage which has acquired a virulence in another individual for the specific bacterium involved."

With these introductory remarks, let us proceed to a consideration of the possible prophylactic and therapeutic value of the bacteriophage.

I. PROPHYLACTIC VALUE FOWL TYPHOID

In 1919 d'Herelle^{2, 3} reported significant results following the immunization of chickens against fowl typhoid during the course of a natural epizootic. About 1600 chickens, including 100 chickens already sick, were inoculated. Each animal received 0.5 cc. of a virulent bacteriophage subcutaneously. In each case the outbreak was promptly arrested. Similar results have also been reported by Kramer⁴ in sixteen natural outbreaks. This investigator also observed excellent results in several natural outbreaks of bacillary white dysentery in chicks, which he had injected with a bacteriophage active for *B. pullorum*. Pyle⁵ has, however, recently reported practically negative results in experimental bacillary white dysentery of chicks. This investigator did not enjoy an opportunity to study the value of bacteriophage inoculations against the natural infection. I should add that Pyle's results do not represent the only failure in attempts which have been made to so immunize animals against experimental infections. Miessner and Baars,⁶ Kramer,⁴ and Levy⁷ have all met with failure in attempts to so immunize mice against experimental infection with *B. typhimurium*. D'Herelle² has failed to protect guinea-pigs against experimental plague. It would appear, therefore, that one is not always justified in drawing conclusions on the basis of experimental infections.

BARBONE

Impressive results have also been obtained by d'Herelle,^{2, 3} in association with Le Louet, chief of the Veterinary Service of Cochín-China, following the prophylactic inoculation of buffaloes against a highly fatal hemorrhagic septicemia known as barbone. The high mortality among these important beasts of burden entailed a great economic loss to the country. D'Herelle states that during an epizootic which he witnessed in one of the provinces 10,000 of the 30,000 buffaloes in the region succumbed to the disease. The mortality approached 100 per cent. The Government

therefore placed a number of animals at the disposal of d'Herelle and Le Louet for investigation. They first undertook to determine the value of the bacteriophage as an immunizing agent against experimental barbone. The bacteriophage employed was a highly virulent race which d'Herelle had recovered from the feces of a buffalo which passed unaffected through the previous epizootic. The bacterium employed to test the immunity was a highly virulent organism which killed the control animals within twenty-four hours.

The bacteriophage was administered subcutaneously, but in these experiments the results differed in certain important respects from those observed in the epizootic of fowl typhoid. In the case of fowl typhoid it was noted that the epizootic subsided promptly after the administration of the bacteriophage, due presumably to its continued as well as immediate activity. In the case of experimental barbone it soon became obvious that two types of immunity, appearing at different times, come into play. First there is a brief refractory period, traceable to the bacteriophage itself, and later a second, more durable, refractory period, due evidently to a stimulation of the animal's own defense mechanism. The first protection disappears within a period of about forty-eight hours, unless as a result of continual reinfection, as under the conditions of an epizootic the bacteriophage becomes more firmly established in the host. The second type of immunity evidently results from the immunizing action of the dissolved products of the bacteria themselves. The time of its appearance seems to depend on the quantity of the filtrate injected. The larger the dose the longer is the incubation period which intervenes. The immunity does not appear, following a dose of 20 cc., until after a period of about sixty days. The injection of 5 cc. shortens the incubation period to about twenty-eight days; a dose of 0.25 cc. shortens it to about twenty days, and a dose of 0.04 cc., less than a drop, conveys a "solid immunity" by the fourth day. That a single dose of even 0.25 cc. will convey a "solid immunity" is indeed surprising, and suggests that lysed bacteria are far more potent antigens than are the intact organisms, a subject which certainly deserves further investigation.

D'Herelle showed that this organic immunity is not in any way due to the activity of the bacteriophage, but related to the products of bacterial lysis, for the same immunizing action obtains after the bacteriophage in the filtrate has been inactivated. It is interesting that, despite the fact that the immunity is stimulated by the products of bacterial lysis, the sera of the animals presented no antibacterial antibodies, although the blood of immunized animals conveys a definite protection to susceptible animals. D'Herelle therefore concludes that the antibodies formed are antitoxic in nature.

The immunity which follows a single injection of the lysed culture seems to border on an actual refractory state. Animals which received an injection of 0.25 cc. of the filtrate developed a resistance to as high as 2000 fatal doses of the

organism, whereas the controls always died within twenty-four hours.

According to d'Herelle,² Le Louet later, as Inspector-General of the Veterinary Service of Indo-China, proceeded to carry out the immunization on a large scale. In September of 1923 he reported that none of the 12,000 buffaloes immunized had contracted the disease, despite the fact that it was prevalent in Indo-China. In 1925 Le Louet⁹ reported that the immunization had been continued and that the incidence of barbone had been reduced to practically nothing.

EXPERIMENTAL SHIGA INFECTIONS

D'Herelle² has also shown that it is possible to protect rabbits against the toxin of the Shiga bacillus, to which these animals are susceptible, by injecting a small dose of a filtrate which has been permitted to age for a week or longer. The filtrate on aging becomes atoxic, but retains marked antigenic properties. The immunity appears by the sixth day and persists for at least six months. D'Herelle's results have been confirmed by Kabe-shima¹⁰ and Sardjito.¹¹ These observations suggest that it may be possible to effectively immunize man against bacillary dysentery by means of filtrates which are no longer toxic.

II. THERAPEUTIC VALUE BACILLARY DYSENTERY

With regard to the possible therapeutic value of the bacteriophage, it must be said that very encouraging results have already been reported. In 1921 d'Herelle¹² reported excellent results in seven cases of Shiga dysentery. In each case the bloody stools stopped within twenty-four hours and the patient entered on immediate convalescence. Shortly after, however, Otto and Munter¹³ in Germany and Davison¹⁴ in this country reported essentially negative results. Da Costa Cruz¹⁵ in South America also obtained essentially negative results in his early work, but later became a most enthusiastic supporter of this form of therapy in dysentery. He attributes his failure in the beginning to the use of a less virulent bacteriophage. It is possible, therefore, that the results of Otto and Munter and of Davison are traceable to the same cause. Up to 1924 da Costa Cruz¹⁶ prepared as a member of the Institute Oswaldo Cruz, at Rio de Janeiro, about 10,000 ampouls for distribution to hospitals and physicians in Brazil. There have been to his knowledge only two exceptions to the uniformly good results reported. Indeed, the promptness with which the patient responds to the treatment is a matter of astonishment to the physicians. The patients as a rule enter on convalescence within twenty-four to forty-eight hours after the bacteriophage has been administered. In Rio de Janeiro this method of treatment is now routinely employed in bacillary dysentery. Its therapeutic value is also affirmed by Pereira¹⁷ in South America, Spence and McKinley¹⁸ in this country, and Munter and Boenheim¹⁹ in Germany.

In the preparation of the bacteriophage suspension destined for therapeutic use, d'Herelle² emphasizes that "it is absolutely indispensable

that the bacteriophage be of maximum virulence for the bacterium upon which it is to act." It is furthermore important that the filtration be made through a candle of known efficiency and that the tubes be inspected for freedom of bacterial growth before use. It is administered by mouth. About two cubic centimeters of the filtrate is given in a half glass of water. Twelve hours later a second dose may be administered. The ingestion of the bacteriophage is harmless, whatever the dose, either for a normal man or a patient suffering from some other disease. In other words, there are said to be no contraindications.

TYPHOID AND PARATYPHOID

Attention has been called to the fact that in immunizing chickens against fowl typhoid, d'Herelle² inoculated 100 chickens which already were ill. Of these only about 5 per cent died, whereas the mortality during the epizootic approached 100 per cent.

Encouraging results have also been reported in human typhoid and paratyphoid infections. Beckerich and Hauduroy²⁰ report favorable results in eight out of twelve cases. In all of the cases the blood culture was positive before the bacteriophage was administered. In six of the cases the temperature dropped to normal within forty-eight hours. Hauduroy and Arsimoles²¹ report a cure in a case with dysenteriform symptoms, which they treated with a mixture of anti-typhoid and antidysentery bacteriophage. The blood disappeared quickly from the stools, and the patient entered on convalescence in forty-eight hours. Hauduroy²² subsequently reported three more cases of typhoid in which rapid improvement followed the administration of an active 'phage. Alessandrini and Doria²³ treated eighteen cases of typhoid, in nine of which they obtained clear-cut results. Smith²⁴ noted immediate improvement in five out of seven cases. Richet, Azerad, and Delarne²⁵ report great improvement in a very severe form of typhoid. Philibert and Hauduroy²⁶ reported definite improvement in some cases and entirely negative results in others, while Herderschee and Wolff²⁷ treated about 100 cases without noting any beneficial results.

From the reports it is noteworthy that either definite improvement immediately follows the administration of the bacteriophage, or no improvement at all is noted. There appear to be no intermediate effects. Several explanations have been offered. Marcuse²⁸ attributes the failures to a possible lack of contact of the bacteriophage and the bacterium, and accordingly recommends intravenous injection in addition to ingestion. Hauduroy²⁹ has found that the addition of bile to the medium inhibits the phenomenon in vitro, and it is therefore possible that the organisms in the gall bladder are protected. Another factor, and one of considerable importance, is the irregular behavior of the various strains of typhoid and paratyphoid bacilli with reference to the bacteriophage. A bacteriophage active on one or on several strains may not be active on others. The strains which resist one race of bacteriophage may nevertheless be fully susceptible to another race. It is there-

fore always necessary to first determine whether the particular strain of typhoid bacilli causing the disease is susceptible to the race, or races, of bacteriophage at one's disposal. Polyvalent, or mixed, suspensions to cover a wider range of possibilities would naturally offer the best solution. The virulence of the bacteriophage intended for therapeutic use is, of course, of first importance.

B. COLI INFECTIONS

Of no little interest are the results which have been obtained in the treatment of *B. coli* infections of the urinary tract. Beckerich and Hauduroy^{20 30} have reported on fourteen cases, in nine of which recovery followed promptly. Hauduroy³¹ subsequently gave considerable attention to this method of treating these stubborn infections, and has reported very favorably on the basis of a large number of cases. This mode of treatment is also enthusiastically endorsed by Philibert.³² Cures have also been reported by Arloing, Dufour, Bouvier, and Sempé³³; by d'Herelle,² Larkum,³⁴ Pereira,¹⁷ Winans,³⁵ and by Zdansky.³⁶ I hasten to add, however, that the cures reported represent only a portion of the total number of cases treated by those I have mentioned. As in the phagetherapy of typhoid fever, some cases seem to respond promptly to this form of treatment, whereas others do not appear to be influenced in the least. Several explanations present themselves. In the first place, it is possible that in some cases, particularly those of long standing, the bacterium responsible may have acquired a resistance to 'phage action as a result of exposure to a bacteriophage of indifferent virulence already present. Sickenga³⁷ reported that he found a bacteriophage constantly present in the urine of four cases of pyelitis in children, and occasionally present in the urine of twelve other cases. Larkum,³⁴ who has made a careful study of bacteriophagy in urinary infections, found a bacteriophage present in one or more specimens of urine in about 36 per cent of the cases examined. Moreover, he observed that in the acute cases the bacterium was practically always susceptible to lysis, whereas resistant forms of *B. coli* were almost always recovered from the chronic cases. In the second place, the irregular therapeutic results may be in part traceable to the fact that *B. coli* is a highly heterologous species with regard to the bacteriophage and that, therefore, the proper bacteriophage, or combination of 'phages, may not always have been employed. Hauduroy, who has isolated a large number of races active on various strains of *B. coli*, found two races which are distinctive for their wide range of activity. He mixes these for therapeutic purposes. Finally there is always the possibility that in some of the trials the virulence of the bacteriophage employed may not have been sufficiently high for the particular job it was expected to perform. At any rate, the factors which determine these irregular results are deserving of further study.

In the treatment of colon infections of the urinary tract, the bacteriophage is administered subcutaneously and by instillation into the blad-

der. Subcutaneously it may be administered in doses of about 2 cc., at an interval of about twenty-four to forty-eight hours, but not more than two doses should be administered in this way.² Bladder instillations should be made at the same time with about a 1:10 dilution of the bacteriophage in physiological saline. The instillations may be repeated, but if a therapeutic effect does not appear within a week it is probable that none will be realized. No reactions are said to follow the administration of the bacteriophage.

STAPHYLOCOCCUS INFECTIONS

Significant results have also been reported for staphylococcus infections. Bruynoghe and Maisin³⁸ injected antistaphylococcus bacteriophage into the base of furuncles and carbuncles of six patients and noted in all of them a marked therapeutic effect within forty-eight hours. Gratia³⁹ about the same time reported successful results on about fifty cases of staphylococcus infections, including furunculosis, carbuncles, and subcutaneous abscesses. Hauduroy³¹ has also noted definite improvement in severe carbuncles. Bazy⁴⁰ has reported very favorably on its application in various localized pyogenic infections. Gougerot and Peyre⁴¹ claim to have cured two cases of syphilis by this mode of treatment. They opened the individual pustular elements and inoculated the bacteriophage into each with the aid of a capillary pipette. A compress moistened with bacteriophage was then placed over the area. Definite improvement was observed after eight to ten applications. Nelson Barbosa⁴² has reported good results in staphylococcus cystitis, while McKinley⁴³ has reported favorably on staphylococcus wound infections.

In furunculosis, d'Herelle recommends a subcutaneous injection of about 1 cc. of a virulent bacteriophage. Another dose may be given twenty-four to forty-eight hours later. In the case of carbuncles and abscesses, 1 to 2 cc. should be injected in small quantities in the immediate vicinity of the lesion. In septicemia d'Herelle would administer 2 to 3 cc. intravenously, and in urinary infections two subcutaneous injections of 1 cc. each, administered at an interval of twenty-four to forty-eight hours. At the same time a morning and evening instillation of the bladder should be made with a 1:4 dilution of the bacteriophage in physiological saline. Since the staphylococcus is a heterologous species it is important to use a virulent polyvalent phage for therapeutic purposes.

STREPTOCOCCUS INFECTIONS

In 1923 McKinley⁴³ reported a therapeutic result in a streptococcus abscess of the lung. Following the rib resection there was considerable drainage of a decidedly foul odor. After two injections of an antistreptococcus bacteriophage into the cavity there was a rapid diminution in the quantity and offensiveness of the discharge. In five days there was practically no discharge and no odor. Dutton⁴⁴ has recently called attention to the fact that the bacteriophage probably

plays an important rôle in spontaneous recoveries from streptococcus infections.

BUBONIC PLAGUE

The latest disease to be treated in this way seems to be bubonic plague. D'Herelle⁴⁰ has recently reported rapid recoveries in four cases of bubonic plague taken off shipboard at Alexandria. In all of the cases the general condition of the patient improved within a few hours after the antiplague phage was injected. Naturally the small number treated does not justify a conclusion at the present time. It is indeed to be hoped that a satisfactory therapeutic measure for this disease is forthcoming in the bacteriophage.

CONCLUSIONS

A review of the literature indicates that the bacteriophage may exercise either a prophylactic or a therapeutic action in certain infectious diseases. We cannot, however, consider the subject closed. Further studies to explain the irregularity of the results are clearly indicated. The apparent harmlessness of the bacteriophage, together with the hopeful results already reported, should encourage further investigation in this direction.

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CHOLESTEROSIS OF THE GALL BLADDER *

II. THE SURGICAL ASPECTS

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IN a previous paper we recorded the clinical data obtained from a study of one thousand cases of cholesterosis of the gall bladder, half of which were associated with gall-stones. The clinical data in the two series showed a striking parallelism, for the presence of stones did not materially alter the clinical picture of this disease. This paper is concerned with the surgical aspects of the disease as revealed by the same series of cases, all of which were surgical.

PREOPERATIVE CLINICAL DIAGNOSIS

The clinician diagnosed gall-bladder disease preoperatively in 85 per cent of the stone-free cases and in 88 per cent of the gall-stone cases. When he attempted to define the type of gall bladder lesion, however, and determine when there were stones he fell into error in many instances. Gall-stones were diagnosed in 24 per cent of the stone-free patients and overlooked in 45 per cent of those with stone. This fact seems of major importance to us, as it suggests the relative unimportance of gall-stones in cholesterosis of the gall bladder. The primary disease is the fat disturbance in the gall bladder; stones are apparently but an incident in this lesion.

In 2 per cent of the cases a diagnosis of pelvic disease alone was made, and gall-bladder lesions

* This is the second of two papers on this subject. The first paper being printed in this journal, in last month's issue.
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were also found at operation. In 5 per cent of the cases a diagnosis of chronic appendicitis had been made when gall-bladder disease existed concurrently (Table 1). Our previous necropsy studies have shown that cholesterosis of the gall bladder occurs in a relatively high percentage of adults (38 per cent). It may give little or no clinical evidence of its presence or, on the other hand, it may be the sole etiologic factor when there is severe epigastric distress, as has been previously demonstrated.

ROENTGEN-RAY DIAGNOSIS

The roentgen-ray diagnoses were interesting because of the high percentage of errors. Unfortunately this series began before the Graham-Cole technique was adopted, so that these statistical data do not represent the present diagnostic value of the roentgen ray. We can compare the relative merits of this new technique, however, by studying the reports of the last year, when the Graham-Cole technique alone was employed, and the reports of previous years. The roentgen-ray

TABLE 2
ROENTGEN RAY VERSUS PATHOLOGIC DIAGNOSIS

Pathologic diagnosis	Roentgen-ray diagnosis				Total Roentgen rays, per cent
	Diseased gall bladder, per cent	Stones, per cent	Questionable, per cent	Negative, per cent	
Cholesterosis	23.3	8.8	2.6	65.1	52.2
Cholesterosis and stones	15.0	41.0	3.6	40.1	47.8

diagnosis was correct in 62 per cent of the stone-free and 91 per cent of the gall-stone cases in the former, as contrasted with 27 per cent and 41 per cent, respectively, in the latter (Table 2). In the latter series 65 per cent of the stone-free cases were called "negative" and 8 per cent were said to be complicated by stones, and stones were overlooked in 40 per cent of the stone cases.

The Graham-Cole technique has decidedly improved the roentgen-ray diagnosis of gall bladder disease, although the percentage error is still quite high. Especially is this true in the cases of cholesterosis without stones. Positive diagnoses are reasonably accurate, but negative reports are not of great value.

PREVIOUS ABDOMINAL OPERATIONS

Forty-four per cent of the patients without stones and 34 per cent of those with stones had undergone abdominal operations previously. In 13 per cent of the former group and in 9 per cent of the latter the operation was drainage of

TABLE 1
CLINICAL VERSUS PATHOLOGIC DIAGNOSIS

Pathologic diagnosis	Gall bladder disease, per cent	Gall stones, per cent	Ulcer, per cent	Appendicitis, per cent	Pelvic disease, per cent	Indeterminate, per cent	Unexpected operative finding, per cent	Gall bladder and adjacent disease, per cent	Stones and adjacent disease, per cent
Cholesterosis	41.6	22.4	4.8	6.0	0.2	1.6	2.2	19.8	1.4
Cholesterosis and stones	25.2	49.0	2.6	5.4	2.4	1.0	1.0	8.8	4.6

TABLE 3
PREVIOUS ABDOMINAL OPERATIONS*

Disease	Cholecystostomy, per cent	Appendectomy, per cent	Pelvic, per cent	Gastric, per cent	Appendiceal and pelvic, per cent	Total, per cent
Cholesterosis	13.2	39.2	20.5	2.2	24.6	43.8
Cholesterosis and stones	8.7	33.1	30.2	2.9	24.4	34.4

*Not performed at Mayo Clinic.

the gall bladder (Table 3). Appendectomy and pelvic operations formed the major portion of the remainder.

This is a surprisingly high percentage of patients with gall bladder disease requiring secondary operations. Obviously cholecystostomy is not a satisfactory method of treating cholesterosis of the gall bladder. It may give temporary clinical relief, and may be justifiable in selected cases, but it does not remove the lesion, as secondary cholecystectomy has so often proved. Moreover it would seem from the percentage of secondary abdominal operations that cholesterosis of the gall bladder has not been adequately studied by surgeons hitherto. We do not mean to suggest that operations are indicated in all such cases. Indeed, they could not be, for the symptoms would not warrant them in many instances and often patients are totally without abdominal distress. But patients complaining of pain definitely situated in the upper abdomen, besides their digestive disturbances, should be more carefully investigated. A history of biliary upsets can frequently be obtained and these should be thoroughly studied before other abdominal operations are undertaken. Judd has shown that cholecystectomy will relieve these patients of their distress if pain is a dominant feature in their complaint.

RECENT OPERATIVE PROCEDURE

Cholecystectomy was performed in all but one of the one thousand cases of cholesterosis of the gall bladder; cholecystostomy alone was done in that case. Choledochostomy was performed in 1 per cent of the stone-free cases and in 5 per cent of the gall-stone cases. The appendix was removed almost as a routine because of the well-known association of appendiceal and gall-bladder disease. Peptic ulcers were found in 5 per cent of the stone-free and in 3 per cent of the stone cases, and excision of the ulcer or gastrojejunostomy was performed also in these cases (Table 4).

Drains were placed in the liver fossa in 33 per

TABLE 4
OPERATIONS FOR CHOLESTEROSIS

Disease of gall bladder	Cholecystectomy only, per cent	Cholecystectomy and choledochostomy, per cent	Cholecystectomy and appendectomy, per cent	Cholecystectomy and gastroenterostomy or excision of ulcer, per cent
Cholesterosis	39.0	1.4	53.8	5.8
Cholesterosis and stones	39.4	5.0	51.6	3.2

cent of the stone-free and in 43 per cent of the gall-stone cases. A recent tendency among surgeons is to avoid the use of drains, however, so that in 1925 drainage was instituted in only 21 per cent of the cases in which cholecystectomy was performed at the Mayo Clinic. The elimination of the drain, provided the operative site is perfectly dry, is considered a decided advance. It decreases postoperative pain, hastens the healing of the wound, and lessens the possibility of bile drainage, which so often occurs with even a small Penrose drain. We have neither had any disastrous results without the drain nor observed any postoperative complications that might have been attributed to its want. However, the selection of cases must be judicious and the wound absolutely dry, or the results will be disappointing and probably even disastrous.

PATHOLOGIC STUDY

Cholesterosis was present in all of the one thousand cases. Stones were present in half the specimens. They were single in 30 per cent of the latter, multiple in 69 per cent, and "sand" in 1 per cent. Ninety-nine per cent of the stones belonged to the "cholesterin-rich" group. In one instance bilirubin calcium stones were found in the cystic duct also. In only four instances were the stones "common" stones, that is, deeply pigmented cholesterin stones. The pigmentation of cholesterin stones is due to bile pigment, which we believe is deposited only in cases of inflammation of the gall bladder. The extremely high percentage of cholesterin-rich stones lends support to our theory that cholesterosis of the gall bladder is primarily a metabolic disturbance.

Cholesterosis alone, as the "strawberry" gall bladder, was the diagnosis in 53 per cent of the stone-free group and in 82 per cent of the stone group, and as the papillomatous gall bladder, in 47 and 18 per cent, respectively. The diffuse and localized lipid accumulations were combined in 34 per cent of the stone-free and in 10 per cent of the stone-containing specimens.

During four years at the Mayo Clinic (1921-1925) cholecystectomy was performed 4409 times. Twenty-six per cent of the removed gall bladders showed cholesterosis and approximately 40 per cent of the latter contained stones.

PANCREATITIS

Pancreatitis was determined grossly at the time of operation by the size and feel of the organ. This, of course, is not an accurate method of diagnosis, as postmortem studies have shown. In 11 per cent of the stone-free cases in this surgical series and in 16 per cent of the gall-stone cases pancreatitis was associated, according to the "corn-cob feel" of the organ (Table 5), but in a previous necropsy study we showed that pancreatitis, as determined microscopically, was present in only about 7 per cent of cases without gall-bladder disease and in 5 per cent of those with diseased gall bladders. From these data it

TABLE 6
PANCREATITIS DETERMINED BY GROSS EXAMINATION
AT OPERATION

Disease of gall bladder	Grade 1, per cent	Grade 2, per cent	Grade 3, per cent	Grade 4, per cent	Grade + per cent	Per cent of total
Cholesterosis	50.0	29.6	3.7		16.6	10.8
Cholesterosis and stones	54.3	27.1	9.8	2.4	6.1	16.2

would seem that palpation is an inaccurate method of diagnosing inflammatory pancreatitis.

HEPATITIS

Hepatitis, as determined by the gross appearance of the liver at the time of operation, was noted in 27 per cent of the stone-free cases and in 14 per cent of the gall-stone cases (Table 6). These data would seem inaccurate, as experimental and necropsy studies have shown the very intimate association of infections of the gall bladder and liver. But when we think of cholesterosis of the gall bladder as a non-inflammatory lesion and the stones as metabolic in origin instead of bacterial we can more readily understand these data. It is true that most livers show more or less inflammation in areas adjacent to diseased gall bladders, but grossly this can be determined in only about 60 per cent of the cases, as shown in our necropsy series. With gall bladders obviously inflamed and containing deeply pigmented common stones, gross hepatitis is associated in almost 90 per cent of the cases. By contrast, hepatitis was present in only 27 per cent of the stone-free cases of cholesterosis. Certainly these data are valuable to the surgeon, for they show that cholecystectomy in cholesterosis of the gall bladder, when indicated, is a prophylactic measure. If the gall bladder is not removed secondary infection and probably stones will result. Hepatitis is then inevitable. The surgeon should be warned, however, that cholecystectomy for cholesterosis of the gall bladder will yield satisfactory clinical results only when pain is a dominant symptom.

SUMMARY AND CONCLUSIONS

The clinical diagnosis of gall bladder disease is correct in about 85 per cent of cases, but it is impossible to determine clinically the type of disease in as large a percentage and whether stones are present in about 35 per cent of cases of cholesterosis of the gall bladder. The Graham-Cole technique has more than doubled the roentgenoscopic accuracy of the diagnosis of diseases of the gall bladder, but negative films are not of

TABLE 6
HEPATITIS DETERMINED BY GROSS EXAMINATION
AT OPERATION

Disease of gall bladder	Grade 1, per cent	Grade 2, per cent	Grade 3, per cent	Grade 4, per cent	Grade + per cent	Per cent of total
Cholesterosis	33.8	29.3	11.2	3.7	21.8	26.6
Cholesterosis and stones	48.5	41.1	5.8	0	4.4	13.6

decided value. Cholesterosis of the gall bladder, with or without stones, is a surgical problem provided pain is a dominant symptom.

Thirty-nine per cent of the one thousand patients in this series had had some type of abdominal operation for a lesion other than cholesterosis of the gall bladder. In 11 per cent of the latter this was drainage of the gall bladder. This shows that secondary abdominal operations are performed in an unnecessarily high percentage of cases. Cholecystectomy is the operation of choice. This was performed in all but one case. Cholecystostomy also was performed in 3 per cent of the cases. Drainage of the liver fossa was carried out in 33 per cent of the stone-free, and in 43 per cent of the gall-stone cases. However, with the present technique drainage is not required in 80 per cent of cases.

In 30 per cent of the five hundred cases with stones the stones were single. In 99 per cent of all the cases the stones were of the cholesterol-rich type. This lends support to the theory that cholesterosis of the gall bladder is primarily a metabolic disturbance. Twenty-six per cent of gall bladders removed as a routine show cholesterosis. Inflammatory changes in the pancreas and liver are much less evident with cholesterosis of the gall bladder with and without stones than other forms of gall-bladder disease. Pancreatitis was diagnosed grossly in 11 per cent of the stone-free and in 16 per cent of the gall-stone cases, and these figures would probably have been reduced by microscopic examination. Hepatitis was grossly demonstrable in 27 and 14 per cent of the cases, respectively.

516 Sutter Street.

PRE- AND POSTOPERATIVE CARE OF THE
GOITER PATIENT*

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WHILE it is true that the preparation of the uncomplicated case of hyperthyroidism for operation is a fairly easy problem, nevertheless, taken as a whole, there is no group of patients which requires a more careful period of preparation and observation.

ROUTINE PREOPERATIVE PREPARATION

The routine preparation of an uncomplicated case consists of the following measures: (1) absolute rest in bed; (2) luminal or bromids each night; (3) large quantities of fluid, at least 3500 cc. every twenty-four hours; (4) tincture of digitalis; and (5) Lugol's solution; and ordinarily in the uncomplicated case the operation can safely be performed in from six to eight days after the patient enters the hospital. In the presence of complications, however, such as edema, extreme dehydration with delirium, or persistent cardiac irregularities, additional measures must be employed and the preoperative period is usually longer.

Since we began the use of *Lugol's solution*, as

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suggested by Plummer, we have been able to perform a lobectomy in many cases in which preliminary ligations were formerly indicated, and thyroidectomy in many cases in which formerly only a lobectomy could be performed. However, the use of Lugol's solution before the patient comes to the surgeon increases the problem presented by certain cases, since the maximum improvement which should be gained by its use usually occurs in from seven to twelve days, and the clinical picture presented by the patient at this stage can never be duplicated. In such cases, therefore, in which, if Lugol's solution had not been given before the patient came to the hospital, we should undoubtedly have been able to perform a lobectomy or a thyroidectomy, it becomes necessary to perform a trial ligation. If no reaction whatsoever follows the ligation, the lobectomies can be performed at once.

We use Lugol's solution routinely in any case in which the diagnosis of hyperthyroidism is made; and, as stated above, we have found that almost uniformly, in an uncomplicated case of hyperthyroidism, the maximum improvement is reached in about eight or ten days. It should be emphasized that in any case the greatest improvement from the use of Lugol's solution follows its use for the first time; also that, according to our observations, the degree of improvement always bears a direct relation to the amount of hyperplasia within the gland.

In a few cases we have been misled by feeling that the patient was in a better condition after

the course of Lugol's solution than was actually the case, and rather severe reactions have followed the operation. Pemberton has had similar experiences and feels that an extra day or two of rest should follow the moment of apparent maximum improvement.

The protection of the myocardium is extremely important, if the cardiac arrhythmias which so frequently follow thyroidectomy are to be prevented. The cardiac complications of hyperthyroidism usually appear in the following order: first, a simple tachycardia, which is followed by dilatation of the heart, this in turn being followed by functional murmurs and by cardiac irregularities, by far the most frequently encountered form of which is auricular fibrillation, although every type of cardiac irregularity will be noted in a large series of cases of hyperthyroidism. In a recent series of cases of hyperthyroidism associated with auricular fibrillation of which Anderson has made a special study, he has found that in 60 per cent the action of the heart became regular after the final operation.

Our routine treatment of these cases is the administration of 30 minims of digitalis every four hours for six or eight doses, followed by smaller doses, 15 to 20 minims every day, until the time of operation. We have found that if this routine is followed there is a much smaller incidence of postoperative auricular fibrillation, and while it is true that auricular fibrillation may be present for some time without proving fatal, nevertheless the fatal cardiac complications of hyperthyroidism usually begin with a fibrillating heart. It must be remembered that when digitalis is used it is not with the idea of attempting to control the tachycardia, but it is employed in those cases in which there is a slight dilatation of the heart and frequent irregularities.

Quinidin is used very infrequently, although in some cases it may be impossible to establish the normal rhythm of the heart before operation without it. This, however, has been true in only a very few cases. In fact we have very seldom been forced to use quinidin either before or after operation in order to reestablish the normal rhythm of the heart.

It is our policy to use fairly large doses of luminal in these cases, and I notice that the statement is made in Bartlett's recent book that patients with hyperthyroidism can tolerate large quantities of luminal. We have found that many of these patients are unable to take bromids. In uncomplicated cases the patients very seldom need morphin or codein, but of course this does not hold true in cases in which severe complications are present.

The patients with myocardial decompensation, edema, and anasarca—a complication which we occasionally see—have to have the same treatment as patients with cardiorenal disease. Of course with patients in this group novasurol is used together with tincture of digitalis. They are placed on a restricted salt-free diet, and their fluid intake is limited to 1000 cc. every twenty-four hours. Little difficulty is encountered in the treatment

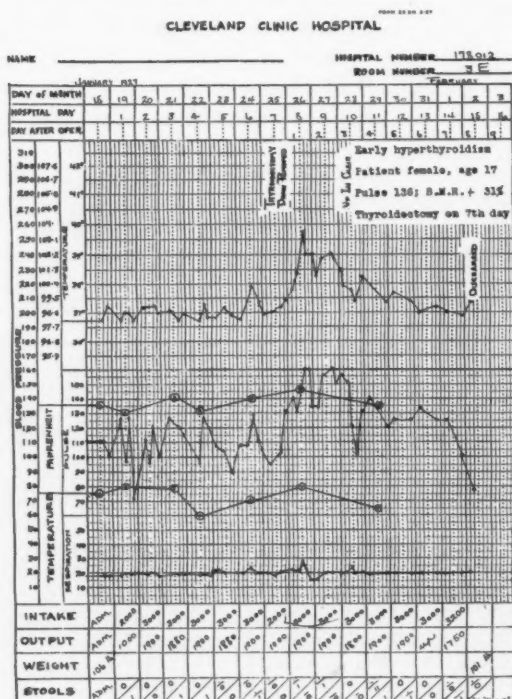


Fig. 1—Chart showing progress in a case of early hyperthyroidism.

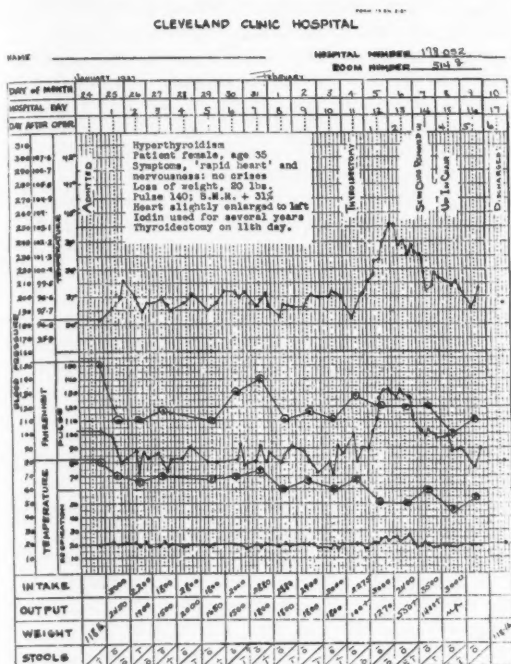


Fig. II—Chart showing progress in a case of hyperthyroidism.

of these patients, and thus far we have had no reactions from the use of novasurol.

In my opinion, the patient with acute hyperthyroidism presents one of the most baffling problems in the whole field of medicine. Patients who have had acute gastrointestinal crises with nausea and vomiting, lasting for several days, and enter the hospital delirious and in a dehydrated condition, are desperate risks. Since the opening of the Cleveland Clinic Hospital some thirty-two months ago, forty-five cases of this type have died before they could be prepared for operation. I believe that if the delirium of hyperthyroidism lasts longer than from forty-eight to seventy-two hours, the prognosis is very poor. We hoped with the use of Lugol's solution to be able to control these patients, but we have not been able to do so. Large quantities of fluids also are forced, and blood transfusions are done. We have observed that the greatest improvement in these patients follows the transfusion of whole blood, one of them occasionally becoming rational immediately after the transfusion. In the majority of these cases, however, the transfusion has little effect.

It seems impossible to explain why the prognosis is so poor in these cases. The blood chemistry studies give normal findings and postmortem examinations which have been made in such cases have shown no condition which could account for death.

The patients who have gone through severe attacks of acute hyperthyroidism must, of course, be handled with extreme care, and I, personally, feel that they should not be operated upon for

from four to six weeks after a period of delirium, as occasionally operation precipitates an acute attack in which the psychosis may become permanent, or which may even terminate fatally. In determining the operability of these cases there are many factors to be considered, and it is especially important that several points in the history be carefully investigated. Experience has taught us that the patient who has recently been through an acute gastrointestinal crisis may have a severe reaction after any operative procedure. This is also true of the patient who has had a marked loss in weight within a short period of time, and of the patient who has recently passed through an acute phase of the disease. The history of any decompensation is also of importance in this respect.

As stated above, we have lost the advantage of Lugol's solution in many of these cases for the reason that the patients have taken iodine for a long period of time before coming to the hospital. It is important to know whether or not this is the case before any operative procedure is instituted.

If, therefore, after a patient has rested for a period of from eight to ten days, the pulse curve has reached a base line which is stationary, there is no edema, no pulse deficit, the heart has been protected by digitalis, the patient is mentally stable and able to take large quantities of fluids, and has a good phthalein output, and if Lugol's solution has been given over the same period, then some type of operative procedure can safely be performed.

It should be emphasized, however, that many of these patients present the same problems as those presented by patients with cardionephritic symptoms and that blood urea and phthalein estimations must be made frequently. Novasurol is occasionally used in the decompensated cases if the edema does not clear up quickly under the ordinary measures.

TYPES OF OPERATION

We depend, therefore, entirely upon a careful history of the case and upon physical examination in determining operability. The basal metabolic rate is used only for differential diagnosis.

As for the type of operation, that also depends upon the patient and his condition. Old and young patients are routinely ligated, all children under 14 and all patients over 60 usually having at least a trial ligation. In our series of cases in children we have found that although they are apt to have very severe reactions to all operative procedures, on the other hand they receive greater benefit from ligation than do adult patients. Frequently they return for the final operation, three months after the ligations, so improved that it is difficult to believe that they are the same children.

With the lengthening of the period of preoperative preparation, the use of Lugol's solution, digitalis, bromids and luminal, and the maintenance of the water balance, not only has the mortality rate been reduced, but the period of postoperative care has been reduced to a minimum in practically all cases.

In the uncomplicated cases the small rubber

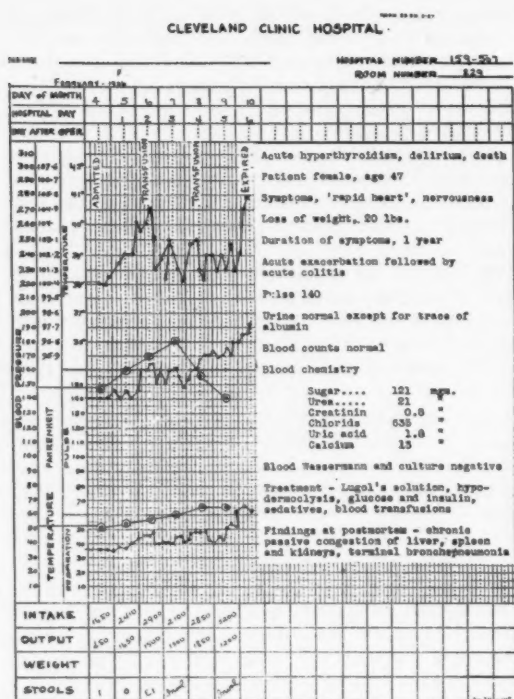


Fig. III—Chart showing the clinical course in a case of acute hyperthyroidism that ended in death.

drains are always removed at the end of twenty-four hours, the Michel skin-clips at the end of the third day, and the patient is up and around on the fifth day, being discharged ordinarily on the evening of the sixth or the morning of the seventh day.

POSTOPERATIVE CARE

Due to the use of Lugol's solution and the absolute control of the patient after operation, acute hyperthyroidism is rarely seen after operation. In comparing the charts of patients in a recent series with those of series of four or five years ago, it was found that the temperature and pulse are now usually somewhat higher. However, formerly patients with a temperature of 103 degrees and a rapid pulse invariably seemed toxic and ill, whereas the same elevation of temperature at this time is not accompanied by toxicity, but the patient is apparently in an excellent condition.

In the cases in which convalescence is prolonged, therefore, this is almost always because of some postoperative complication. If the patient becomes extremely ill after operation, and has a high temperature and a rapid pulse, this is very frequently due to the collection of serum in the wound and in many cases the temperature of the patient will drop as soon as the serum is removed, the removal of even a very small amount of serum changing the entire picture.

The immediate complication with which we are always concerned is a *postoperative hemorrhage*, for it demands immediate care. There are several points in the treatment of a postoperative hemor-

rhage which are important. These patients do not die from a loss of blood, but from suffocation caused by the pressure of the blood-clot upon the trachea. They become cyanosed, dyspneic, and very quickly lose consciousness, and even if the period of unconsciousness is brief they may not recover. Of course as soon as the blood-clot is removed, the condition quickly clears up. If possible, it is best to remove the clot under very light nitrous oxid-oxygen anesthesia, as it is very difficult to catch the bleeding point under local anesthesia. In many cases, however, the clot must be removed immediately and a pack placed in the neck until the bleeding point can be caught.

De Quervain, basing his opinion upon the findings in a large series of these cases, feels that most of the postoperative hemorrhages come from the upper pole of the thyroid. We do not have any statistics on this point. It should be borne in mind, however, that one should be able to control a hemorrhage from either the inferior or the superior pole very easily by pressing the bleeding point forward against the muscles and the skin, the artery being held between the first two fingers and the thumb, with the thumb on the outside of the wound and the two fingers beneath the bleeding point, until the field can be thoroughly cleaned out and the bleeding point caught.

A second very great danger that attends a postoperative hemorrhage is an injury to the recurrent laryngeal nerves. This is especially apt to occur if the hemorrhage is from the inferior pole, for if the vessel has retracted in the effort to catch the bleeding point the hemostat may be placed on the nerve. There is also a small vessel close to the tracheoesophageal groove which may bleed and it, of course, is very near the site of the recurrent laryngeal nerve. The nerve is not so apt to be caught if the hemorrhage is from the superior pole, unless the point of the hemostat is directed toward the larynx and is caught very close to it.

Still another type of postoperative hemorrhage which may occur and which, in our experience, has been practically always fatal, is an extravasation of blood into the mediastinal space. This is most apt to occur after operations for intrathoracic goiter. In such a case the patient's pulse becomes very rapid, gradually diminishing in quality, and he grows very pale and restless. The mediastinal dullness is increased and the patient finally dies as the result of absolute pressure upon the heart walls. It is our policy, if we are not certain that complete hemostasis has been secured in these cases, to place a gauze pack in the cavity for twenty-four hours and to make a secondary closure. It must be remembered that in most cases the so-called cavities of intrathoracic goiter are quickly obliterated by the expansion of the lungs and that before the operation is completed the whole operative field can be clearly seen. However, there are a certain number of these cases in which the goiter is of long standing in which the walls of the cavity have become fixed, so that a very large cavity is left and it may be very difficult to see all parts of it. Under these

circumstances it is well to pack the wound open.

A very distressing complication which may follow an operation upon the thyroid gland is *stridor*. This is always due to an injury of one or both of the recurrent laryngeal nerves, the so-called "collapse of the trachea" being, in my opinion, largely a myth.

In the treatment of stridor one must first be absolutely sure that there is no blood-clot behind the preglandular muscles and that the serum has all been removed, for often the removal of even a small amount of serum, or the mere loosening of a drain may release pressure which, though slight, was sufficient to cause the stridor.

If a laryngoscopic examination can be made it is very helpful, but care must be taken that it is done very quickly and deftly, for the patient may quickly become dyspneic and the stridor increase. It is usually found, of course, that the patient has a very narrow breathing space. We have frequently noticed that these patients are extremely restless and are not controlled by means of the usual sedatives, and we have also noticed that as soon as a tracheotomy tube is inserted they invariably go to sleep and rest for a long time.

We always advise early tracheotomy in case of stridor, and feel no hesitancy in opening the trachea, even though there is no cyanosis, for if the stridor persists for several hours the patient may suddenly become exhausted or he may even become unconscious, and when that occurs the patient occasionally does not recover even after a tracheotomy. When a tracheotomy is performed the incision is always made transversely between the tracheal rings, and the tracheotomy tube is never left in place longer than two or three hours. After it has been left in place for that length of time the patient usually has no further difficulty, and if the tracheal rings have not been severed,

the opening closes up very rapidly and the patient makes an uneventful recovery.

The *cardiac complications* which may follow thyroidectomy are simply tachycardia and auricular fibrillation, or auricular flutter. These complications are largely preventable by careful digitalization. If the pulse rate continues to rise above 130 we give digifoline hypodermically, as tachycardia may lead to auricular fibrillation, and this may be followed by a fatal dilatation of the heart. We have seen a marked diminution in the incidence of postoperative cardiac complications since we have used digitalis.

Tracheitis is a postoperative complication which is occasionally seen, and we feel that it is directly related to the exposure of the trachea at the time of operation. We are very careful, therefore, not to divide any of the fascia over the trachea or in any way to expose the tracheal rings. We are very careful also to leave a triangular portion of the thyroid in the tracheoesophageal region as a protection for the recurrent laryngeal nerves and for the parathyroid bodies; thus only a small area of the anterior surface of the trachea should be exposed where the isthmus is dissected off. Tracheitis is not a serious complication in most cases, and small doses of codein every hour for six or eight hours are usually effective in relieving it.

An *infection in a thyroidectomy wound* is a very distressing complication, and must be handled radically. It is our policy to open the neck widely and to irrigate the wound thoroughly, not only because in severe hyperthyroidism the patient cannot tolerate an infection of any type, but also because there is danger that the remaining portion of the thyroid may slough, with a resultant scarring and damage of the recurrent laryngeal nerves and the parathyroid bodies. If this happens three of the most unfortunate postoperative complications that can occur in thyroid surgery may possibly result, namely, a paralysis of the recurrent laryngeal nerves, tetany, and chronic hypothyroidism.

Tetany, as a postoperative complication, is fortunately of rare occurrence. The parathyroid bodies can practically always be protected by leaving a layer of thyroid tissue over them. Occasionally a mild case of tetany is seen in which the patient complains of slight numbness and tingling of the hands and feet, and of a peculiar sense of constriction about the mouth. A slight circumoral pallor is also noted. The first measure for the relief of this condition is the removal of any wound secretion that may be present, as pressure on the parathyroids may be the cause of the disturbance. The clonic convulsions of acute tetany, in which the fingers are flexed at the metacarpal phalangeal joints, the thumb is drawn across the hand and the arms, across the chest, the toes are in extension, and the patient is in a generalized convulsion, are very rarely seen; although, of course, there is always the possibility that such a condition may develop from what seems to be a mild case.

Formerly we always used magnesium sulphate, 15 cc. of a 25 per cent solution, administered

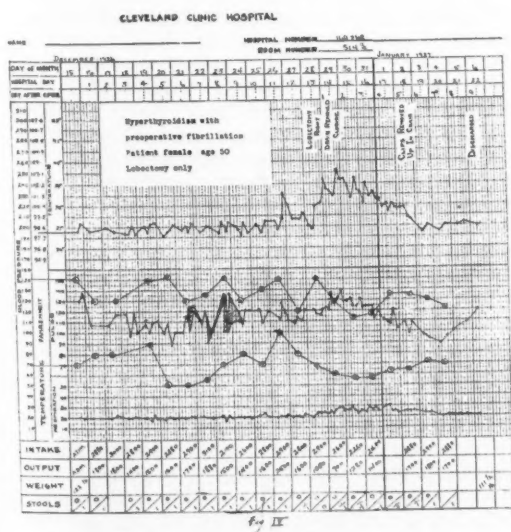


Fig. IV—Chart showing progress in a case of hyperthyroidism complicated by auricular fibrillation.

The shaded portion indicates the difference between the apex beat (the upper line) and the radial pulse (the lower line).

intramuscularly, and this always relaxed these patients. However, a recurrence of the attack almost invariably occurred, and the magnesium sulphate had to be given for several successive days. Fortunately the parathyroid hormone which has been prepared by Professor Collip has proved entirely effectual in the control of this complication, and after one injection of the hormone a second convulsion almost never occurs. For this reason we give the parathyroid hormone routinely upon the appearance of numbness and tingling of the hands and feet, taking a sample of blood at the same time for the purpose of checking the blood calcium. In the mild cases we always give calcium lactate, 10 grains three times daily, with parathyroid extract, 1/10 of a grain, and a small amount of thyroid extract.

We have also found the use of the parathyroid hormone effective in the treatment of cases of chronic tetany. An interesting observation has been made that in many of these cases the calcium content of the blood was not abnormally low, so that we feel that the tetany is probably due to a disturbance of the calcium metabolism rather than to a change in the calcium content of the blood.

Nausea and vomiting is a very rare postoperative complication at the present time because of the forcing of fluids in the preparation of the patient for operation, and also because the operation is performed under analgesia. When it does occur we immediately discontinue the administration of food or fluids by mouth and inject large quantities of water under the skin by Bartlett's method; that is, 1/32 per cent novocain in normal saline solution (90 cc. of 1-500 1 per cent novocain to 200 cc. normal saline).

An acute *myxedema*, with a peculiar drowsiness and a shiny appearance of the skin, may appear after from seventy-two to ninety hours following operation, and it is accompanied by a peculiar type of nervousness which ordinarily cannot be controlled by sedatives. To prevent this, Doctor Crile has for years given the patients routinely 2 grains of thyroid extract the night before operation and 2 grains on the morning of the operation.

A transient *myxedema* is quite frequently seen following operation upon patients with hyperthyroidism, especially in those cases in which the minimum amount of tissue has been left *in situ*. When this condition occurs it usually appears three or four months after operation. The patients complain of becoming fatigued easily, of loss of memory, and of a slightly abnormal gain in weight. The skin is somewhat dry and there is a peculiar puffiness about the eyes, especially under the eyes. They often complain also of coldness of the hands or feet. For this condition we prescribe a grain of thyroid extract each morning for one month, and this is usually sufficient to prevent any further difficulty. The 30 grains of thyroid extract is obviously not enough to take care of the needs of these patients, but probably

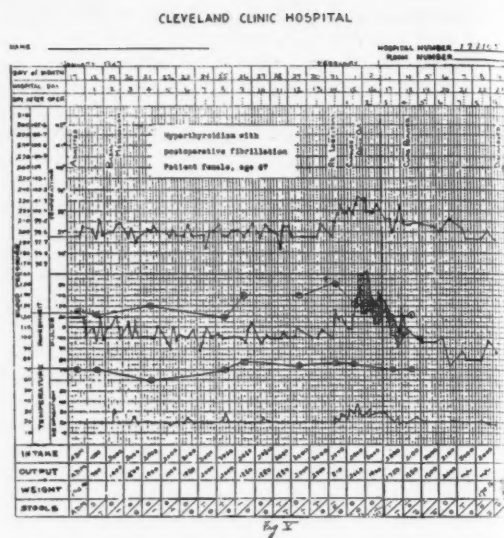


Fig. V—Chart showing progress in a case of hyperthyroidism in which auricular fibrillation developed after the operation.

The shaded portion indicates the difference between the apex beat (the upper line) and the radial pulse (the lower line).

stimulates the remaining portion of the thyroid tissue to a normal activity.

When a true chronic myxedema follows thyroidectomy it offers an extremely difficult problem. It would seem that by the administration of sufficient thyroid extract one should be able to establish and maintain a normal metabolism. However our experience has been that this is an extremely difficult thing to do; the various subjective symptoms and the pulse rate and metabolic rate are very difficult to control.

OPERATIVE MORTALITY

The mortality in thyroid surgery is approximately 1 per cent. In my own cases half of the deaths have been caused by emboli, and this problem of course is unsolved. I have also been unfortunate enough to lose two cases from postoperative collapse of the lung and, although this complication has not often been noted, I am sure that it occurs more frequently than we had formerly suspected. A very interesting fact was brought out in the last case. Although the condition was readily diagnosed before the post-mortem examination, the patient presented all the symptoms of a so-called "acute hyperthyroidism reaction."

IN CONCLUSION

In conclusion we may state that by means of a careful preoperative study of the case both from the history and the physical examination; by absolute rest in bed and treatment with luminal, Lugol's solution and digitalis; followed by graded operations with a careful guarding against postoperative complications, the outlook for ultimate recovery in cases of hyperthyroidism has been made as hopeful as that offered the patient undergoing any major operation.

Cleveland Clinic.

PHTHISIS—ITS SURGICAL MANAGEMENT*

PREOPERATIVE CONSIDERATIONS

By HENRY HOIT, M. D.

DISCUSSION by *Leo Eloesser, San Francisco; Philip King Brown, San Francisco; Harold Brunn, San Francisco; Charles D. Lockwood, Pasadena.*

FOR more than two decades attempts have been made to inhibit the function of the lung most affected by tuberculosis for the purpose of promoting its healing. Encouraged by the apparently remarkable improvement which so many patients have made after an experience with pleural effusion and reasoning that the result might be due to the incidental "compression" of the lung, men have tried earnestly in various ways to check the ability of the lung to expand. Tightly strapping the thorax, placing weights upon the chest wall, partially filling one or both sides of the thoracic cavity with air and removing sections of the ribs, have been and are being practiced as methods to control the function of the lung and to produce a therapeutic effect.

FOCAL REST

How to account for the improvement so often realized by patients after an experience with simple serous effusion is not so easy as it would appear to be, the situation within the thorax in the presence of fluid is so complicated. It may be that the fluid exerts a hydrostatic force, compressing the lung and interfering with its functional activity. It may be that it serves as a splint to the lung, effecting its immobilization and accomplishing functional rest. Or it may be that the effusion is a phase of tuberculo-immunity and has an immune-biologic action when absorbed. However it may happen, noticeable improvement frequently follows the absorption of the effusion although it seems not to be related in time or degree to the volume or persistency of the fluid. It is barely possible that the effusion is just a coincidence and that the improvement observed is not a consequence of it, directly or indirectly.

What seems to be a more likely explanation to account for the improvement in certain cases of active pulmonary tuberculosis is the incidental "contraction" of the lung and the ensuing changes in the blood supply, conditions which appear to be favorable to reparative processes in pulmonary tissue. We know that "contraction" or atelectasis of the lung occurs naturally about a focus of infection in the parenchyma. In tuberculosis it is observed in the beginning and until healing has taken place. It plays a part in the barrier which nature forms about the lesion. It may be seen in the roentgenogram and it may be perceived through the adventitious sounds characteristic of it. It represents the forces of defense and repair concentrating on the process. It tends to restrain the dissemination of infection—to prevent bacillary metastases. It is nature's method of facili-

tating healing and the formation of fibrous tissue.

Improvement is so often witnessed when more than a common amount of "contraction," collapse or relaxation of the lung tissue is permitted, as by an effusion, that it would seem advisable to try to induce such a state and the associated conditions which evidently are so favorable for healing. If the methods employed are feasible methods, it is almost our duty to apply them for the sake of improving the situation of those affected with phthisis.

A review of the more recent literature reveals much in the way of facts to justify the inference that an exceptionally good result is quite apt to follow "contraction" of the lung, artificially induced. The reports published tend to confirm our opinion that the methods employed, particularly pneumothorax and multiple costectomy, are real adjuvants in the management of phthisis. Pneumothorax seems to be especially valuable, as it may be used to induce relaxation in one or both lungs simultaneously. In the presence of gas in the thoracic cavity there often occurs an effusion which seems to operate beneficially. When there are holes in the lung and widespread fibrous pleurisy "contraction" of the lung may be accomplished by reducing the volume of the thorax. The volume may be reduced commensurately with the amount of lung tissue destroyed by removing larger or smaller sections of the ribs. This method—multiple costectomy—should be regarded not as a substitute for pneumothorax; it has its own field of usefulness. In every case where these methods have been employed, bed rest should precede and follow their application. Entire credit for the improvement witnessed may not fairly be given to the method of course, as the normal coefficient of improvement from the bed rest may not be determined.

RÔLE OF SURGERY IN PHTHISIS

Before setting forth certain views with respect to the advantages of surgery in the management of the advanced stage of pulmonary tuberculosis I should like to call attention to one or two points. It is our opinion that very few patients with phthisis have the ability to make a "cure" in an anatomical, biological or any other sense, through the natural processes of resistance, defense and repair, unless they are assisted surgically. It is also our opinion that few patients with phthisis have a chance to recover their health through the aid of surgery unless the method employed is intelligently related to the requirements imposed by the physiological and pathological conditions within the thorax and lungs. We believe that patients with lesions quite alike do not have an equal chance to recover health; individuality makes the difference. We believe that patients with lesions quite unlike, other things being equal and allowed for, do not have a better chance to recover by the aid of surgery unless the method is intelligently applied. In other words, fixed ideas or standards with respect to type of cases or method, should not be entertained. Comparatively speaking, less attention should be paid to pathology and more attention should be paid to alteration

* Read before the General Surgery Section, California Medical Association at the Fifty-Sixth Annual Session April 25-28, 1927. See also *Bedside Medicine* Department in this issue, for further discussion of this subject.

of function; less attention should be paid to the manner in which the method is applied and more attention should be paid to what may be accomplished by it in the particular case. Herein lie possibilities of remarkable success or pitiful failure.

Among the advantages claimed for surgery in the management of phthisis are the following:

First: Surgery may save the patient time, punishment, and money. It may accomplish in a few weeks what months of bed rest might not bring about successfully, if at all. After one has witnessed the relatively rapid improvement in a febrile, toxic patient following directly the introduction of a few hundred cc. of air into the pleural cavity or following a well-executed multiple costectomy, one cannot but realize that the patient is being saved months of invalidism, suffering, and expense.

Second: Surgery may exercise control over the situation in the lungs irrespective of the cooperation of the patient. With one or both lungs artificially deflated up to the limit of tolerance, a patient may not pursue activity without disturbing his respiratory comfort.

Third: Surgery may induce relaxation of pulmonary tissue. Apparently essential to the localization and healing of a focus of infection in the lung is the establishment of an ample degree of atelectasis about it. This is nature's barrier to check the metastatic diffusion of germs and is a part of the process of defense and repair.

Fourth: Surgery may contribute to the deletion of the catarrhopogenic organisms contaminating the tubular structures. The tubercle bacillus is innocent with respect to the production of pus, and is a symbion more often than we realize. It is obvious that an individual may not ever be well while pyogenic organisms live at his expense.

Fifth: Surgery may make possible the apposition of the walls of cavities and the cessation of accumulation. Unless holes in the lung are closed to the invasion of microorganisms, the unhappy state of these people may not be improved.

Sixth: Surgery may permit contraction of the lung in the part which is the most seriously affected. Unless the diseased portion is well protected by defunctionalized tissue, healing is not as likely to take place so kindly in the presence of activity of the healthy portion.

Seventh: Surgery may create about the lung most affected conditions conducive to its welfare regardless of the behavior of the individual. Thus protected, a patient may pursue his occupation and become relatively self-supporting.

Eighth: Surgery may anticipate the crippling effects of natural healing, especially the embarrassment of the heart due to its displacement and fixation in an abnormal position.

Undoubtedly a larger number of susceptible people would be more successful in their struggle with pulmonary tuberculosis if their management might be undertaken and might be intelligently carried on before irreparable damage had ensued through neglect. It is altogether too evident that the danger people with tuberculosis of the lungs are in is not being sensed opportunely and that

a *laissez faire* attitude is being entertained too long toward many cases making little or no progress with respect to recovery. Standing in the way of success in the surgical management of the terminal stage of pulmonary tuberculosis is the appearance of the cases too late, due partly to the disposition of people to let well enough alone, and partly to the apparent reluctance upon the part of the profession to resort to other than medical measures until the patient is mortally ill.

If one considers all the circumstances surrounding the victims of phthisis, it is obvious that only a very few, relatively speaking, are being given a chance. Until time and experience have demonstrated the superlative advantages of bed rest plus good surgical management, it is evident that many are going to miss their opportunity to make a recovery.

In the meanwhile surgery is proving its superiority over medicine for the patient with advanced pulmonary tuberculosis, and it is accomplishing for an increasing number what nothing else can accomplish for them.

La Vina Sanitarium.

DISCUSSION

LEO ELOESSER, M. D. (490 Post Street, San Francisco)—Doctor Hoit's most interesting paper and especially the most extraordinary films of double pneumothorax which he has just shown startle us, but must command respect and attention. I should be ungrateful for the many kindnesses that he has shown me were I to enter into this discussion in any other than an open-minded and receptive, even though critical, spirit.

I do agree with him in this: that there are probably certain cases of pulmonary phthisis (by which, if I understand him correctly, he means secondarily infected pulmonary tuberculosis) that are from the beginning unamenable to conservative treatment. The great difficulty lies in recognizing which they are. Time perhaps may teach us to tell and to propose early operations in the suitable ones. For the present, however, until we learn more about the prognosis of pulmonary tuberculosis, I have hesitated in recommending operation until medical treatment has been tried and proved unavailing.

It is a dangerous thing to discuss early operation in an open mixed meeting, but Doctor Hoit's ideas cannot be passed over in silence.

✱

PHILIP KING BROWN, M. D. (909 Hyde Street, San Francisco)—Seven years of study of the results of surgical treatment of chronic pulmonary tuberculosis largely unilateral convinces me of several things. When the patient is first examined and the physical signs, x-ray plates and history point to a long-standing unilateral process with cavitation and evident pleural thickening, or an acute rapidly developing unilateral process with cavitation of the size of a walnut or greater, the most intensive rest treatment, including postural rest, must be followed and the physical findings should be checked by monthly x-ray plates. After two or three months at the most, if there has not been a marked and steady diminution in the febrile condition, toxicity of the patient, amount of sputum, physical signs, and size of the cavity, some surgical assistance is indicated and should be instituted immediately. The first of these is artificial pneumothorax carried to the point of producing rest in the affected lung—often complete disuse if that amount of compression be necessary to close cavities and arrest activity. If adhesions prevent sufficient collapse, then phrenicotomy may be tried as a result of which the diaphragm on the affected side is raised and a certain amount of relaxation and rest produced.

The cutting of adhesions by the method of Jacobus

or thoracotomy may be tried if a skilled operator be at hand.

Finally, if a permanent collapse be indicated we are confronted with the absolute indication for thoracoplasty, and as Doctor Hoit has pointed out, its extent and nature must be based on what the indications are for the permanent rest of the diseased lung.

✱

HAROLD BRUNN, M.D. (384 Post Street, San Francisco)—The application of surgical procedures for the cure of pulmonary tuberculosis is gradually gaining headway. It is right and proper, however, that progress along these lines should be extremely slow and conservative. Many of the procedures must still be considered in the formative stage and we will still have to await the collection of statistics covering various types of cases before we should optimistically advise the early resort of surgery to tuberculosis.

Statistical studies on the other hand are very difficult to evaluate because surgery is applied to so many different types of cases.

I agree with the doctor, therefore, that the most important consideration is the careful selection of cases for operation and this should be done only after conference between the surgeon, medical man and roentgenologist, and after a considerable lapse of time so that the progress of the case may be watched before surgery is applied.

It is my own belief that surgery in tuberculosis still has many limitations; that we must still not be too optimistic in our indications and prognosis.

I found on my trip east that the indications for phrenicotomies have been widely increased and are being used quite extensively, and also that after collapse therapy where the result has not been too satisfactory because of cavity at the apex, that apicolysis has been added with very satisfactory results.

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CHARLES D. LOCKWOOD, M.D. (65 N. Madison Avenue, Pasadena)—I am sure we have all been impressed by the very unusual paper of Doctor Hoit. I think we are all agreed that rest is the essential thing in the healing of tuberculosis. This not only limits the spread of tuberculous lesions in the lung, but also favors fibrosis. What Doctor Hoit speaks of as "contraction of the lung" is brought about partly by compression and partly by changes in the circulation.

All surgeons who have had experience in the treatment of tuberculosis will agree with Doctor Hoit's statement that surgical compression is logical and brings about conditions most favorable to the healing of tuberculosis. I assume that in urging early resort to surgery that the minor surgical procedures are referred to such as pneumothorax, phrenicotomy and liberation of adhesions.

I do not think in the present state of our knowledge that we are yet able to select the cases which will ultimately demand surgery for their cure. However, I believe this is the goal toward which we should strive, and that as we accumulate experience in the surgical treatment of more advanced cases we will come to recognize the type of tuberculosis that is the forerunner of these advanced cases.

It is certainly refreshing to find a medical man of Doctor Hoit's experience so open-minded and ready to accept the benefits of surgery in the treatment of pulmonary tuberculosis.

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AUTHOR (closing)—The tubercle bacillus has been recognized for years as the etiological factor, but apparently it is not responsible for the various phenomena which we recognize as tuberculosis of the lungs. Seldom does this disease follow infection; seldom does it follow infection directly; seldom does it pursue a regular course similar to other diseases of germ origin. We have reason to believe that a number of factors are operating to account for its manifestations in the lungs. We do not yet know what they are, and even if we did we might still be in the dark as to what weight any one or more of them might have in any particular case. Not knowing, therefore, what the factors are which really are responsible for

this chronic affliction, can we do more than just guess what may be the outcome? Surely no one today is basing a prognosis upon the pathological picture.

It may be true that apparent recovery occurs frequently coincidently with the institution of certain conditions with respect to the individual and with respect to his lungs. But if we only might know what happens to him later I think that we would be convinced that very few so-called "advanced cases" do well—make favorable progress, uninterruptedly and satisfactorily. According to statistics the odds are very much against complete recovery—176 to 1. Of course no one really knows how many do well or fail because so few, comparatively speaking, have been followed all the way through.

For years we have been trusting the solution of one of the most complex medico-biological problems—tuberculosis of the lungs—to people not competent to solve it. We have kept on in the face of failure after failure, entrusting the result of our so-called "treatment" to people who ought to be the most concerned about it but in reality they have usually proven to be most unconcerned. We have expected such people, medically uneducated, with meager or no knowledge of how to live, with little or no capacity for wise self-direction, to accomplish the impossible—the "cure" of pulmonary tuberculosis. Do such statistics as are available, with respect to their success and which are at the same time reliable, encourage the idea that those who now are or who are presently to be severely afflicted are going to get well?

Now that we have methods which are proving every day to be feasible methods and which evidently are very helpful, often producing results independently of the cooperation of the patient, why postpone their application and why not attempt as soon as possible to save a situation fraught with so many evil consequences? I believe that procrastination is inconsistent with our experience; not to do all that may be done at once for an individual facing the crippling effects of the disease, is failing him. Altogether too much of serious import may happen in two or three months. Are we not too prone to delay the application of these measures, influenced by the concepts and conclusions of others without knowing how well they were considered? I am glad that more and more surgeons are becoming interested, are appreciating the possibilities and are willing to lend a hand to these people in their need.

Is it not time to admit to everybody, including patients, that "cure" is impossible, that it is futile to expect it? Is it not time to set up as a goal in place of cure "a degree of health which may justify some familial or industrial efficiency?"

Medical men—the advocates of conservative treatment—have incorporated the surgical principle of rest in their program of treatment, much to the advantage of their patients. But how many sense the fact that the rest induced by restricting the activity of the body—bed rest is only relative and, comparatively speaking, very minor in comparison to what may be induced by these surgical methods. I believe that more of them would appreciate the advantages of these measures if they could only see the remarkable changes in these people when they are applied successfully. Bed rest as practiced has promoted comfort, brought about amelioration of symptoms, produced general improvement, but it never has established permanent relief. It has acted as a blanket put over a fire or as morphin in acute appendicitis; it has covered up the menace to health and life, but has not eliminated it.

The measures surgery now offers may not be the last word in effectiveness. No one is so foolish as to believe that, but they do accomplish a greater degree of rest in the lungs than can otherwise be induced, and is not that desirable?

The history of pulmonary tuberculosis is a story of failures, medically speaking. The experience of a century indicates plainly that if success is to be realized efforts in behalf of these people—the management of their lives, their relief from environmental pressure both external and internal must be made early. The

reason why real progress has not been made is because we have been too often satisfied to apply to the lungs the principle of rest half-heartedly, whereas it should have been applied up to that point of completeness just short of lung function incompatible with life, and in time.

THE THERMOPHORE—ITS USE IN EYE THERAPY*

REPORT OF CASES

By M. F. WEYMANN, M. D.
Los Angeles

DISCUSSION by Frank H. Rodin, M. D., San Francisco;
A. Ray Irvine, M. D., Los Angeles; Otto Barkan, M. D.,
San Francisco.

THE thermophore was devised by Shahan of St. Louis in his search for a means of combating pneumococcus ulcer of the cornea. After many painstaking experiments he found that the pneumococcus in the cornea could be destroyed by a temperature of 152 degrees F. applied directly to the infected area by means of a nickel-plated brass conductor, and that this method of destruction did less damage to the cornea than any other means of destroying the pneumococcus now in use. It was also found that the normal cornea will stand temperatures of up to 150 degrees F. applied with this instrument without permanent scarring, but that 160 degrees F. will cause permanent opacity of more or less degree.

The thermophore itself consists of an electrical heating coil, in the center of which is placed a thermometer and a receptacle for various sized nickel-plated brass conductors for application to the tissue. The temperature is controlled and kept constant by an adjustable thermostat. Thus when the instrument is set at 140 degrees F. it remains within one degree of this temperature indefinitely by automatic control. The conductors have different sized and shaped tips for application to the various lesions to be treated.

TREATMENT OF PNEUMOCOCCUS ULCER

First we shall discuss pneumococcus ulcer for the treatment of which the instrument was primarily designed. Where I have used the thermophore in these cases the results have been excellent. It is necessary to apply it as soon as the ulcer is discovered and in the manner described below.

The eye is cocainized by instillation of 4-5 drops of 5 per cent cocain at 3-5 minute intervals. I always use either a subconjunctival injection of 1-3 min. of 5 per cent cocain or one of B. and W. 1/20 gr. cocain ophthalmic discs following this, five minutes before the application of the thermophore. Then an applicator is selected which will not only cover the ulcer, but will overlap the gray infiltration surrounding the ulcer into healthy tissue. It can be demonstrated histologically that pneumococci have penetrated in advance of the zone of gray infiltration. If the ulcer is of such size or shape that one conductor will not cover the entire area, successive applications of different sized conductors are made

at the same sitting to cover the entire area. The conductor is brought into actual contact with the cornea and only enough pressure exerted to slightly dimple it. I have proved by experimentation on my own skin that the pressure exerted on the applicator has a marked effect on the amount of heat absorbed and the depth to which it penetrates. If there is any advancing edge on the ulcer on the next day it is a sign that an area was missed by the applicator and another application to this active area must be made. One uses the temperature of 160 degrees F. for one minute at each application to be sure to be above the thermal death point of pneumococci. The application must also be made continuously for one minute to get the full effect.

In his article on "Thermal Death Points" in "Contributions to Ophthalmic Science"—Doctor Jackson's birthday volume—Shahan goes into detail as to the temperatures which normal and tumor tissues will stand as applied by the thermophore.

The corneal epithelium is the most easily destroyed at 130 degrees F., but as this readily regenerates we need not worry about its destruction. Permanent damage to the corneal stroma and Bowman's membrane is not done until the temperature goes over 150 degrees F., so that with temperatures under this point we get no permanent scar. The sclera is very resistant, but I have observed complete atrophy of retina and choroid with no permanent damage to overlying sclera with 160 degrees F. for 3-5 minutes applied to the sclera in rabbits. As Shahan points out that the thermal death point of most tumor cells is under 145 degrees F., we may easily destroy small tumors without permanent damage to normal tissues.

Now as to actual case reports and clinical experiences. In all these cases the thermophore was applied with local cocain instillation anesthesia followed by subconjunctival injection or a 1/20 gr. B. and W. cocain tabloid.

CASE REPORTS

I have had four patients with dendritic ulcer treated with the thermophore.

The first was seen in February, 1924. After using everything from silver nitrate to absolute alcohol with refusal to heal for a month the thermophore was applied at 140 degrees F. for one minute to the entire area. Three days later there was no staining with fluorescein. A month later two small areas broke down, but healed in less than a week and have remained healed to date, as the patient was recently seen.

The second was first seen in October, 1925. The ulcer progressed for eight days under conservative treatment. The thermophore was then applied at 135 degrees F. for one minute.

The ulcer had healed on the following day. This ulcer was over the center of the pupil and that was the reason for the temperature of only 135 degrees F. In November there was a marked central opacity of the cornea. Dionin was prescribed and in January, 1926, the vision was

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20/20 with correction and only a faint nebula visible. The ulcer never recurred.

The third patient was seen in consultation with Doctor Jesberg in December, 1926. She had had dendritic ulcer on and off for ten months. The whole lower half of the cornea was involved. The entire area was covered, using 140 degrees F. for one minute. The pupillary area which was uninvolved was not touched. This patient experienced severe pain for five days following the treatment, which had to be kept under control by morphin and hyoscin. In all the others the pain was controlled by aspirin or allonal. There was only a slight stain on the day following treatment and no staining on the fifth day. On January 14, 1927, there was much clearing of the cornea and no further trouble.

The fourth was treated in January, 1927, the application made at 136 degrees F. for one minute. Complete healing followed in three days and the cornea is now clearing with dionin. From these experiences it would seem that application from 136 degrees to 140 degrees F., depending upon the severity of the ulcer, will cause healing in from one to five days and that the after treatment with dionin leaves very little scar. The scar persists from the ulcer and not the area touched with the thermophore.

Another patient with a progressive non-infected ulcer near the limbus was treated by the usual methods for ten days without healing. The thermophore was used for one minute at 140 degrees F. followed by healing in three days. The ulcer has not recurred. Thus one use of the thermophore is for the stimulation of healing of non-infected ulcers of the cornea.

My personal experience with corneal new growths has been limited to three cases. These have been epithelial growths, apparently non-malignant, entering from the limbus. One growth was covered with a waxy film and had been curetted with recurrence. I saw a similar growth in consultation with Doctor Irvine upon which we used the thermophore. In all of these corneal growths I used 150 degrees F. for one minute. In the first few days following the thermophore application there was hemorrhage into the growth and swelling. Then it gradually began to absorb and disappeared entirely, leaving practically no scar.

One large dermoid of the cornea was treated using repeated applications at 160 degrees F. for one minute, but there was so much fibrous tissue present that the treatment was ineffective.

A conjunctival nevus was removed using 150 degrees F. for one minute. The absorption took a period of almost two months. I saw one in the office of Doctor Ewing where a second application was necessary to cause complete disappearance of the growth.

At the General Hospital I have shown a patient where a granuloma extending from the plica up around under the upper fornix and around into the lower fornix was absorbed completely with

150 degrees F. applied over its entire extent for one minute. This was done in three sittings.

Non-pigmented nevi of the lids, especially those near the margin which one does not wish to excise may be destroyed through repeated applications at 150 degrees F. If the patient is very sensitive one may infiltrate with novocain. In experimental work I have removed small pigmented nevi and hemangiomas with 150 degrees F. for one minute.

Large, horny warts must have the horny layer removed with nitric acid and the pointed conductor plunged into their center at 160 degrees F. for one minute. My results with xanthomas have not been successful, as the process seems much more difficult than the simple excision and suturing of the skin. I have not used the instrument in trachomatous pannus, although Luedde of St. Louis reports a favorable result. Twice I have used the instrument on very small basal cell epitheliomas, less than five mm. in size, in the orbital region with complete disappearance and healing of the ulcer using 150 degrees F. for one minute.

In experimenting on myself on the skin of the forearm and allowing the instrument to rest with its full weight using a 4 mm. contact I found the following results: 135 degrees F. for one minute caused a temporary erythema; 140 degrees F. for one minute an erythema lasting several days, but with no permanent destructive effect; 145 degrees F. for one minute caused destruction of the skin with scar tissue replacement, but with an almost unnoticeable scar after a few months; 150 degrees F. for one minute left a quite noticeable scar. As the pressure used here was much greater than that ordinarily used and the skin is much thinner on the forearm, it is safe to conclude that under usual circumstances temperatures up to 150 degrees F. may be used on skin tumors without fear of a noticeable permanent scar.

CONCLUSIONS

To sum up my experiences I think we may say that the indications for thermophore therapy are:

1. Infected progressive ulcers of the cornea which require 160 degrees F. for one minute.
2. Non-infected progressive or indolent ulcers of the cornea requiring 135 degrees to 140 degrees F. for one minute, the lower temperature to be used if the ulcer is in the pupillary area. If this does not cause healing a second application with a higher temperature may be made.
3. Any tumors, malignant or non-malignant, of cornea or conjunctiva which require 150 degrees F. for one minute, to be repeated if entire mass does not absorb after the reaction is complete.
4. Non-malignant tumors of lids and skin surrounding eye where the mass is not so great that conducted heat will not penetrate. These require 150 degrees F. for one minute.

The precautions to be observed if one wishes success are complete anesthesia, an applicator large enough to extend well out into normal

tissue, and pressure firm enough to dimple the cornea or dent the skin.

2007 Wilshire Boulevard.

DISCUSSION

FRANK H. RODIN, M.D. (490 Post Street, San Francisco)—During the last twenty-five years many useful instruments have been added to the oculist's equipment. The most useful for therapeutic purposes is Shahan's thermophore. Doctor Weymann has fully covered the indications and the method of applying the thermophore.

There are a few points in applying the instrument which may be helpful in obtaining the best results. It is not necessary to emphasize the importance of proper anesthesia. The thermophore is best applied while the patient is in a supine position on an examining table or couch. It can also be applied while the patient is in bed. Having brought the instrument to the desired temperature, and having selected a conductor most suitable for the purpose, the thermophore is applied the same as one would a tonometer. If the patient cooperates and the lesion under treatment is small the eyelids may be separated with the fingers when applying the instrument, otherwise an eye speculum is indicated. The patient fixes with his normal eye at a point on the ceiling in such a way that the surface to be treated on the affected eye is directly upward. The surgeon must keep his eye constantly on the area under treatment and see that the thermophore is properly applied. It is well to have a nurse or an assistant to watch the time and notify the surgeon when the required time has elapsed—usually one minute.

My experiences in treatment of corneal ulcers with the thermophore are similar to those of Doctor Weymann. There is nothing so distressing to the patient and such a source of anxiety to the surgeon as a corneal ulcer that refuses to clear up in spite of all topical applications of drugs. Here the thermophore is most useful. It will not only shorten the period of treatment but will permit the patient to return to his work sooner. The tendency is to delay the application of the thermophore. Any pneumococcus ulcer or any large ulcer should have the thermophore applied at once, also any corneal ulcer that does not show an improvement after a few days of routine treatment. I believe that some of the cases of corneal ulcers reported which necessitated conjunctivoplasty might have been cured by the application of the thermophore without resorting to an operation. It is true that such intractable ulcers are not very common; but even if one such case occurs during a year's practice which can be helped with the thermophore the inclusion of this instrument in the equipment of every oculist is recommended.

My experience with the application of the thermophore to corneal and other growths has been limited. The tendency is to remove such growths surgically. However, there are many cases in which this instrument can and should be given a trial before resorting to surgical or other means.

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A. RAY IRVINE, M.D. (709 Westlake Professional Building, Los Angeles)—After five or six years' experience with the use of the Shahan thermophore, I agree with Doctor Weymann that it is one of the most valuable adjunct therapeutic agents in our armamentarium. For indolent corneal ulcers and also acute cases that tend to progress rapidly, the thermophore, applied with a point sufficiently large to cover the ulcer and immediately adjacent infiltrated area, has given me better results than any other means which I have tried.

The pressure used in applying the point is of as great importance as the time used for the application. A pressure sufficient to flatten the corneal area involved will insure the most efficient penetration of heat, and the time of one minute at 140 degrees F. for corneal lesions will not destroy the normal tissue.

For papillomata of the lids it is necessary to first remove the horny layer before applying the instru-

ment. We may here use a few more degrees of heat.

In a case of recurrent wax-like epithelial growth extending from the limbus and covering one-third of the cornea and into which were a number of angry vessels, I was able to completely remove, leaving transparent cornea. After eight months there has been no recurrence. Three applications at 140 degrees for one minute at week intervals were necessary, parts of the growth not having been covered at the first application.

In a case of very large papilloma of the upper lid, extending from the upper border of the tarsal plate to the margin of the lid, one in which surgical removal would have produced a considerable deformity of the lid, I was able entirely to remove in three or four applications, without deformity.

✱

OTTO BARKAN, M.D. (490 Post Street, San Francisco)—I take pleasure in complimenting Doctor Weymann upon calling the attention of the western specialists to the Shahan thermophore. His excellent exposition of the subject seemed to me to fill a definite gap. No one that reads his interesting paper can fail to be impressed by the excellence and the manifest uses of the instrument.

Our experience in its application on several hundred cases has been most satisfactory. We agree that it constitutes a great step in advance in ophthalmological therapy. Not only can such conditions as herpes corneae, recurrent erosions, various types of chronic, recurring ulcers be cured within a few days—which formerly required several weeks or even months to relieve—and the patient thereby be saved a tedious convalescence but, in many of these conditions, the very rapidity of the cure, as well as the minimum destruction of tissue entailed, saves the patient permanent loss of vision.

DOCTOR WEYMANN (closing)—Lest we seem too optimistic I may say that ulcers healed by means of the thermophore may break down if attention is not paid to clearing up foci of infection and other etiological factors. Also one must select his cases with a knowledge of the underlying physiological principles of thermophore therapy and not use it where stimulation will do harm instead of good. But we may say that of all the means of therapy at our command for these conditions the thermophore, when properly used, gives the highest percentage of successful results.

NON-SPECIFIC PROTEIN THERAPY IN DERMATOLOGY*

By HIRAM E. MILLER, M.D.

AND

NORMAN N. EPSTEIN, M.D.
San Francisco

DISCUSSION by Ernest Dwight Chipman, M.D., San Francisco; George D. Culver, M.D., San Francisco; George F. Koetter, M.D., Los Angeles; Kendal Frost, M.D., Los Angeles.

THE remarkable disappearance or improvement in certain chronic diseases following an attack of an intercurrent and unrelated infection has been a rather common and puzzling clinical observation. Instances of this nature are within the experience of most practitioners. The apparent cure or arrest of a syphilitic infection following an exfoliative dermatitis due to arsphenamin therapy is a frequent finding. The favorable influence of malaria or some other fever producing infection upon general paresis of the insane is well established. One of us has seen a striking improvement in a patient almost moribund

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from Hodgkin's disease after a very severe attack of herpes zoster of the thoracic region. A resistant lupus erythematosus has been seen to disappear during the course of typhoid fever. Malignant tumors, Hodgkin's disease, and lepra nodules have been known to recede after an attack of erysipelas. From a study of these clinical experiences, and in an attempt to reproduce therapeutically similar changes in the body, there has been developed the modern practice of non-specific protein therapy.

NON-SPECIFIC PROTEIN THERAPY

Non-specific protein therapy consists in the injection of some foreign protein into the human body either intravenously, intramuscularly, or subcutaneously. The injection is followed by a reaction which may be mild or very severe, the patient presenting a clinical picture of shock. The degree of reaction will depend upon the protein used, the amount injected, the mode of administration, the age of the patient, and the disease from which he may be suffering. This non-specific reaction is fundamentally the same in all instances irrespective of the agent used to produce it. In the main, it consists in the production of a chill followed by a rise in temperature which usually returns to normal within twenty-four hours. There is an initial leukopenia followed by a leukocytosis; the serum and lymph enzymes are increased; and the patient may complain of nausea, vomiting, headache, and general malaise. The degree of reaction necessary to produce therapeutic results is not known, but it would seem, in most instances, that a mild reaction is as efficacious as a severe one.

Obviously a severe reaction would do definite harm to an individual with an active tuberculosis or in a state of debility.

Peterson, in his monograph upon this subject, presents a chart showing the great variety of agents that may produce the non-specific reaction. Some of these were formerly employed empirically in therapeutics. He mentions counterirritants, normal and immune sera, milk, casein, gelatin and nucleoproteins, split protein products, enzymes, tissue extracts, vaccines, bacterial extracts, colloidal metals, iodides, yeasts, heliotherapy, x-ray, radium, and many others. The fact that x-ray, radium, and heliotherapy may act in this way is of particular interest.

It is beyond the scope of this paper to go into the mechanism of the non-specific reaction or to attempt an explanation of the therapeutic effects obtained by this form of therapy. Suffice it to say that by the artificial production of this reaction, the body is able successfully to take care of or detoxicate certain toxic products produced either as a result of broken-down tissue proteins or by the disintegration of bacterial bodies. Because of its non-specificity, this form of therapy has been employed in a great variety of clinical conditions.

METHODS FOR PRODUCING THE NON-SPECIFIC PROTEIN REACTION

We have used four methods of producing the non-specific protein reaction in various derma-

tological conditions. (1) lact albumen has been given intramuscularly and intradermally, (2) typhoid vaccine intravenously, (3) autoserum, and (4) vaccines intramuscularly.

The most practical method for clinic and office practice has been the use of lact albumen manufactured under the trade name of "Aolan." It is a milky fluid which is injected intramuscularly, preferably into the gluteus muscles, in 10 cc. doses every five or seven days. It produces little pain at the site of the injection. The reaction usually consists in a moderate rise in temperature, occasionally chilly sensations, slight malaise, and headache. It comes on from six to eight hours after the injection and persists for a few hours. Many patients do not notice any reaction, while others have a moderate discomfort. The most severe reaction is usually seen after the initial injection. It is quite safe to employ this method in ambulatory patients. While it is probably advisable to use smaller doses in children, we have had better therapeutic results where a full dose of 10 cc. was used. No evidence of anaphylaxis was noted in any of the patients.

"Aolan" may be employed intradermally in doses of 0.1 to 0.2 cc., two or three wheals being produced upon the flexor surface of the forearm twice weekly. We have not noticed any beneficial therapeutic effects from this method of treatment.

Probably the best method of producing the non-specific reaction in hospital patients is by means of a typhoid, paratyphoid alpha and beta vaccine injected intravenously. Seventy-five million organisms, diluted in a few cc. of normal saline, injected intravenously, are sufficient to produce a moderate reaction. This consists of a chill lasting from 15 to 30 minutes, with the temperature rising to 39 degrees C. or more, and the patient feeling quite sick for a few hours. The reaction usually comes on within a few moments after the injection and persists for ten to twelve hours. This therapy should be repeated every five or seven days for 3-5 injections, increasing the dose by twenty-five million organisms.

The third method has been the use of autoserum. From 10 to 20 cc. of the patient's blood is withdrawn from a vein in the arm and immediately injected into the patient's buttocks. This must be executed rapidly in order to prevent clotting in the syringe. The reaction produced by this method is usually slight, and may be unnoticed except for moderate soreness at the site of injection.

A staphylococcus and streptococcus vaccine, both autogenous and stock, has been used in an attempt to obtain a specific reaction against the offending organism. The stock vaccine was found to be of as much value as the autogenous one. This is probably explained by the fact that the basis of most vaccine therapy is a non-specific protein reaction.

DERMATOLOGICAL CONDITIONS IN WHICH NON-SPECIFIC PROTEIN THERAPY WAS USED

1. *Kerion Ringworm*—Non-specific protein therapy probably finds its greatest usefulness in dermatology in the treatment of kerion ring-

worm of the scalp and beard. In this type of tinea infection the lesions are quite deep, are usually discrete, and kerionic formation is a prominent feature. A series of ten cases of kerionic ringworm of the scalp were treated, with gratifying therapeutic results. All of these patients were completely cured after four intramuscular injections given at five to seven-day intervals. The process subsided to a considerable extent after the first injection, and after the third no organisms could be demonstrated in the lesions. While it is true that various local applications were used in these cases, the rapid response to therapy could only be attributed to the foreign protein reaction.

A patient with a large-spored tinea infection of the beard and presenting boggy kerionic masses over the face and neck cleared up rapidly after three injections respectively of seventy-five, one hundred, and one hundred and twenty-five million organisms of a typhoid, paratyphoid alpha and beta vaccine given intravenously at five-day intervals.

This form of therapy does not seem to have any effect upon the superficial, non-pustular, small-spored types of tinea.

2. *Sycosis Vulgaris*—This chronic pyogenic infection of the beard seems as resistant to foreign protein therapy as it does to other forms of treatment. In some cases the results have been encouraging, while in others they have been most disappointing. Although we have not had any complete cures of this condition by the use of non-specific therapy, certain individuals have been definitely benefited by the treatment. Intramuscular injections of milk or "Aolan" were as effective as large doses of the typhoid, paratyphoid alpha and beta vaccine given intravenously.

3. *Pyoderma*—Chronic pyogenic infections of the glabrous surface of the skin are frequently benefited by the injection of a foreign protein. A chronic pyogenic ulceration of the neck improved remarkably after one injection of "Aolan" intramuscularly. The pyogenic element in an eczema or dermatitis may be controlled by foreign protein therapy.

4. *Acne Vulgaris*—In this disease we have used the intradermal method of injection, using "Aolan" in 0.1 cc. doses. There were apparently no beneficial results obtained. In the extensive pustular type of acne, intramuscular "Aolan" in 10 cc. doses is of value.

Autogenous and stock vaccines, likewise, have been of little value, in our experience, in the treatment of acne vulgaris.

5. *Furunculosis*—There is some benefit obtained by the use of autogenous and stock vaccine in patients with persistent and recurrent furunculosis. It is of little value in the treatment of acute and solitary lesions. This is the only type of foreign protein therapy that we have used in this disease.

6. *Eczema and Seborrheic Dermatitis*—These cases were not particularly benefited by non-specific therapy except where the pyogenic element was pronounced. It is interesting to note

that one patient with extensive seborrheic dermatitis became definitely worse after each injection of "Aolan."

7. *Syphilis*—Certain syphilitic lesions, resistant to specific medication, are frequently cleared up quickly with the aid of foreign protein injections. Interstitial keratitis clears more rapidly under intramuscular milk therapy than with anti-syphilitic drugs. Syphilitic iritis will involute after intravenous typhoid vaccine injections. A case of malignant syphilis, presented by Doctor Ormsby at the 1926 annual Chicago Dermatological Society meeting, resisted all specific medication and progressed to the point where the upper lip and the entire nose were destroyed. The lesion was finally controlled by foreign protein therapy. The malarial treatment for general paresis of the insane has proved of definite value.

8. *Lupus Erythematosus*—Cases of lupus erythematosus are frequently benefited by non-specific reactions of various kinds. A case of lupus erythematosus disseminata cleared almost completely after a series of intravenous injections of typhoid vaccine. The improvement noted after the use of colloidal gold may be considered as a result of a non-specific reaction. Lupus erythematosus has cleared under injections of phy-lacogen. The striking improvement in some of these cases after tonsillectomy is probably the result of absorption of broken-down tissue proteins at the site of the operation. Lupus erythematosus has cleared during the course of typhoid fever.

The improvement seen in lupus erythematosus is not permanent, as a rule, but foreign protein therapy is a definite aid in the treatment of the disease.

9. *Dermatitis Herpetiformis*—Autoserum therapy has been used in the treatment of this disease. The reaction obtained is slight, but the treatment is occasionally of value in clearing up severe exacerbations of the disease.

10. *Chronic Urticaria*—We have used autoserum and "Aolan" in the treatment of this disease. Over a period of several years we have found that autoserum intragluteally will often cure the disease when all other methods have failed. "Aolan" has not been as efficient in our hands.

SUMMARY

Of the four methods of non-specific protein therapy with which we are familiar the use of "Aolan" or milk intramuscularly is the most practical for clinic and office practice. This method is of definite value in the treatment of kerionic ringworm of the scalp, certain cases of sycosis vulgaris and chronic pyoderma.

The use of typhoid, paratyphoid alpha and beta vaccine intravenously is best suited for hospital patients because of the severe reaction obtained. This method is of particular use in the treatment of kerionic ringworm of the beard, resistant syphilitic lesions, and lupus erythematosus.

Autoserum therapy finds its best application in the treatment of severe attacks of dermatitis herpetiformis and chronic urticaria.

The use of autogenous or stock staphylococcus

and streptococcus vaccines do not seem as effective in most instances as the milk injections.

We have briefly reviewed our experience with non-specific protein therapy.

CONCLUSIONS

1. Non-specific protein therapy is curative in kerion ringworm of the beard and scalp.
2. Certain resistant syphilitic lesions respond to non-specific protein therapy after the so-called specific drugs have failed to influence them.
3. Nonspecific foreign protein therapy, while not necessarily curative in many chronic dermatoses, has a definite place in the treatment of them.

334 Post Street.

DISCUSSION

ERNEST DWIGHT CHIPMAN, M.D. (350 Post Street, San Francisco)—The paper by Miller and Epstein is deserving of much praise because it is a definite contribution that is calculated to stimulate dermatologic research in the field in which it is most needed.

There are numerous dermatoses the cause of which we have never discovered. Some of these we handle, after a fashion, empirically. There are others in which we may or may not know the cause that defy our best therapeutic efforts.

While there may be details in which some of us may differ, it seems to me that the paper should be considered in its entirety as representing a sincere effort to make progress where progress is required. The merit of the paper is as great in what it suggests as what it states; it even holds out hope against that bugbear of dermatologists, lupus erythematosus. For all its conservatism and modesty, the paper is most stimulating.

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GEORGE D. CULVER, M.D. (323 Geary Street, San Francisco)—In discussing "Non-Specific Protein Therapy in Dermatology," as presented by Doctor Miller and Doctor Epstein, I wish to express my appreciation of the careful manner in which they have prepared their subject. So much depends upon therapy in dermatology that whatever proven additional aid can be given to this part of the subject becomes of untold value.

Many of us have noted in our experience that kerion ringworm, whether of the beard or scalp, that may have the most formidable appearance may be the most amenable to treatment. I recall a number of instances, one of an adult with kerion of the nape of the neck extending into the scalp that made a spectacular recovery. This recovery might well be explained by the fact that with a marked added pyogenic infection there was a rapid absorption of non-specific proteins.

The assistance given one in treating that most obstinate syphilitic manifestation, interstitial keratitis, is a great boon to the syphilologist.

Doctor Miller and Doctor Epstein deserve our commendation.

✽

GEORGE F. KOETTER, M.D. (1136 West Street, Los Angeles)—Non-specific protein therapy is of definite value in the treatment of certain dermatoses.

Psoriasis, lupus erythematosus, and other recalcitrant dermatosis of unknown etiology resist our best therapeutic measures.

I have observed remarkable, apparently curative results in the treatment of dermatitis herpetiformis by the intravenous injection of autoserum or peptone.

Miller and Epstein deserve praise for their concise, stimulating presentation of this subject.

✽

KENDAL FROST, M.D. (523 West Sixth Street, Los Angeles)—Doctor Miller's and Doctor Epstein's résumé of the situation is indeed noteworthy and deserves careful study.

I might add that many cases of psoriasis respond,

at least temporarily, to non-specific protein therapy. I have used it chiefly in the form of autogenous blood or autoserum. Many cases which have resisted local applications of all sorts will respond readily after a series of treatments of this sort.

We can well do with more work of the painstaking and modest type of Miller and Epstein.

POLIOMYELITIS INVOLVING THE URINARY TRACT

By HENRY A. R. KREUTZMANN, M.D.
San Francisco

THAT lesions of the spinal cord frequently involve the bladder, and may do so quite early in the course of the disease, in fact sometimes before any pathology is noted in the central nervous system, is becoming more and more evident.

Nitze was the first to call attention to the changes in the bladder which occur in cerebrospinal lues. The cystoscopic picture in this disease is a characteristic one, and the term "tabetic bladder" is now of common usage.

Bladder changes have been observed in many other diseases involving the central nervous system, and in these cases the term "spinal-cord bladder" is used.

BLADDER CHANGES IN SPINAL-CORD DISEASES

The various cord conditions in which bladder changes have been noted and reported are: tabes dorsalis; postapoplectic conditions; gumma of spinal cord; tumors of spinal cord; psammoma of the dura mater; fractures of the spine; injuries of the cord; hematomyelia; syringomyelia; spina bifida; pernicious anemia.

The symptoms in spinal cord bladders form a distinct group which are quite typical in most cases. In the early stages there is an irritation of the nerves and a spasm of the vesical sphincters so that there may be difficulty of urination or even acute retention. As the nerves become paralyzed, a different picture presents itself. In the later stages there is hesitancy in urination and the stream lacks force. At times the patient complains of nocturnal enuresis.

If the bladder is free of infection the patient's only complaint may be great-straining on voiding and weakness of the urinary stream. However, if infection is present we have the added symptoms of frequency, urgency, dysuria, and nocturia.

The terminal stage, associated with entire destruction of the spinal cord may produce either paralysis with automatic emptying of the bladder or complete incontinence.

Examination of these patients reveals certain findings common to most of them. The external genitalia are flabby and show marked loss of tone. There is considerable straining on the part of the patient before the urine begins to flow. The stream is of poor force, with dribbling at the end. Catheterization causes little or no discomfort, due to diminished sensation. On passing a soft rubber catheter some obstruction is felt at the bulbomembranous junction as a result of the constant spasm of the external sphincter. When the eye of the instrument enters the posterior

urethra urine begins to flow. The bladder contains a varying amount of residual. While the urine is being withdrawn through the catheter the stream is slow and lacks force, even when augmented by straining on the part of the patient. The urine may be clear, but in most cases pus and bacteria are present.

On cystoscopy no difficulty is encountered in passing the instrument. The bladder walls at the base, laterally and at the dome, show trabeculations. They are in most instances very fine, due to atrophy of the bladder musculature. At times they may be coarse, due to hypertrophy of those muscle fibers which have escaped being involved in the paralysis.

The trigone is not thickened as is the case in bladder obstruction, but is thinned and at both ends divides into trabeculae. The internal sphincter is relaxed, so that the cystoscope can be pulled into the posterior urethra without tilting it. The posterior urethra is ballooned, the walls are smooth and atonic and can be examined with an anterior scope. The mass of tissue composing the internal sphincter is seen rising like a wall in front of the supramontaine region, due to the relaxation of the muscles in the posterior urethra.

The cystogram shows a funneling in the region of the internal sphincter as a result of the filling of the posterior urethra from the bladder.

For the past eight months, we have had under our care a patient whose findings are similar to those just described and in whom none of the spinal cord conditions previously mentioned were found.

URINARY CONDITIONS AND POLIOMYELITIS

It is certain that the urinary changes in our case were due to poliomyelitis, and we believe that this disease should be considered as one of the possible causes of spinal-cord bladders.

The textbooks make little mention of bladder involvement in infantile paralysis. Strumpell¹ states that "micturition is sometimes a little dis-

turbed at the beginning of the disease, but in most cases this disturbance completely disappears later." Osler² merely states that "the bladder may be involved." That there may be some effect on the urinary organs in the early acute stage has been noted by a number of clinicians. Schaller³ cites a case of acute poliomyelitis in a patient twenty-one years of age in whom the bladder extended to the umbilicus and necessitated catheterization. In another instance the patient had to be catheterized twice because of acute retention. Peabody⁴ in a summary of cases treated in the Boston epidemic of 1920 states that one patient was unable to void for two days. Bugbee⁵ more recently reported the case of a boy one year old suffering with a distended bladder due to acute infantile paralysis. He states that this is the first case to be mentioned where bladder paralysis was the initial symptom.

Braasch⁶ states that involvement of the centers of urinary control by poliomyelitis is not common. Occasionally, however, with extensive lesions, the motor fibers are affected, leaving an atonic bladder.

All the references which we have been able to find describe the bladder involvement as occurring in the acute stage of poliomyelitis. With one exception there has been no case history reported where the urinary tract was involved in the later stages of the disease.

Camphora⁷ reported the case of a boy aged fourteen who was suffering from complete urinary incontinence for the last seven years. At the beginning of his illness gastro-intestinal symptoms kept the patient in bed nine months. Neither the boy nor his parents could remember whether or not there had been any convulsions or paralysis of muscles pointing to a participation of the spinal cord in the pathological process. The author concluded that as the patient had no symptoms of tabes, it may be presumed that the affection was poliomyelitis. This is the only report found suggestive of bladder involvement years after the onset of the disease.

REPORT OF CASE

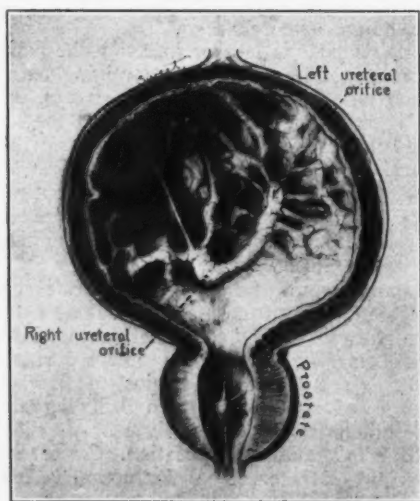
The case history of the patient to whom we have referred was obtained by questioning his mother, by reviewing the original notes of the late Dr. H. S. Sherman, kindly offered us by Doctor McChesney, and by examining the records at the Children's Hospital.

The history is as follows:

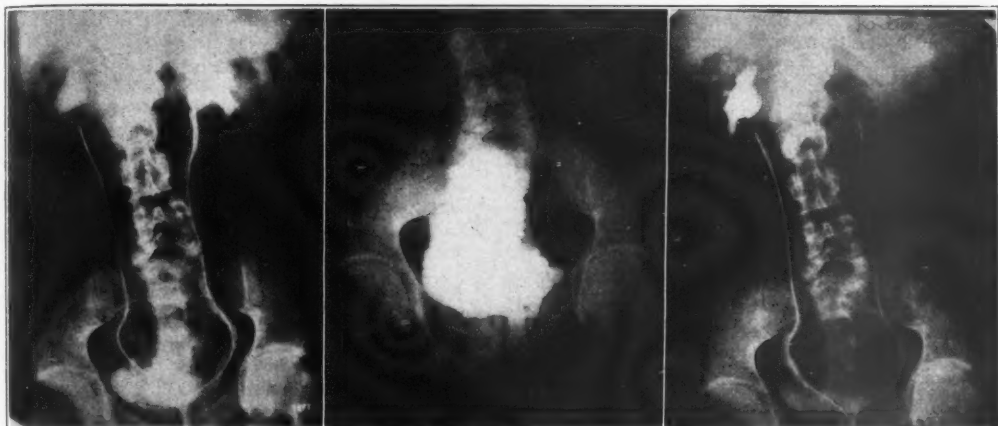
H. H., male, aged 31. Family history irrelevant. With the exception of the present illness, the patient has had only the usual diseases of childhood.

He was perfectly well until his second year, when he began to have pains upon stepping down suddenly. At this time he was irritable, did not sleep well, and had continual twitching in both legs and thighs, most marked on the right side. When 3 years old the twitchings became less marked, the pain disappeared and the general condition improved. His gait, however, was very poor and so at the age of 5 he was brought to Doctor Sherman, who stated at this time that the patient's condition was due to poliomyelitis.

A tendon transplant was performed when the patient was 6 years old. The urinalysis at this time was



Drawing showing the interior of the bladder with multiple cellulules and distorted trigone. Note also the dilated posterior urethra.



Left pyelogram—hydronephrosis

Cystogram showing multiple cellules and funneling of the posterior urethra.

Right pyelogram showing moderate hydronephrosis with obliteration of secondary calices.

normal. The bedside notes give no indication of any bladder disturbance being present.

The next year the mother noticed the boy to be suffering with frequency, urgency, and bed wetting. He was brought to my father, who prescribed some powders.

A second tendon operation was performed at eight years. The hospital urinalysis at this time makes no mention of pus cells, but states that a great amount of detritus was present. The patient's urinary symptoms began when he was 7 years old, and have continued with little variation up to the present time. He now voids on an average of once every hour, has great urgency, hesitancy, and the stream is of poor force. Nocturnal enuresis occurs about two or three times a week. The urine has a foul odor. There is no dysuria or hematuria; no lumbar pains or ureteral colic. The sexual powers are greatly diminished, erections occurring only infrequently.

Physical examination shows partial paralysis of the muscles of both legs, associated with constant fibrillary twitching. The scrotum is pendulous and a left varicocele is present. The rectal sphincter is relaxed and there are some external hemorrhoids. The prostate is of normal size and consistency. The secretion shows nothing pathological. A voided urine specimen is alkaline; S. G., 1026; no sugar, heavy cloud of albumin. Microscopic examination shows no red blood cells, but a large number of pus cells. The bladder contains 265 cc. of residual urine. Cystoscopy shows the bladder floor, walls and dome to be covered with coarse trabeculations in the interstices of which are many cellules of varying depth. The trigone is greatly distorted and twisted to the left so that the right ureteral orifice is situated near the midline, while the left is far toward the left wall. The internal sphincter is greatly relaxed. No difficulty is experienced in moving the scope into the posterior urethra. The walls here are dilated, there are fine striations about the verumontaine, and the internal sphincter is seen rising up like a dam. The bladder urine showed *B. coli*. Number six ureteral catheters were inserted to each kidney pelvis without difficulty, notwithstanding the abnormal position of the ureters. Urine from both kidneys showed numerous red blood cells and an occasional pus cell. Cultures from both sides were negative. A half-hour phthalein test showed 14.3 per cent of the dye coming from the right kidney, while 21.8 per cent was eliminated on the left side.

Pyelograms showed moderate dilatation of both kidney pelvis with beginning obliteration of the major calices, especially on the right side. Cystogram showed a huge irregular bladder outline with a filling of the posterior urethra.

COMMENT

From the history it is quite certain that the urinary tract involvement began at the same time as did that of the spinal cord. It is also evident that the same agent which produced a paralysis of the nerves going to the leg muscles had also caused a paralysis of the sympathetic and parasympathetic nerves which supply the bladder.

Whether or not the hydronephrosis is part of the same process, we do not know. It is not due to back pressure from the residual urine, as the kidney cultures were negative and the cystogram showed no opaque solution in the ureters or in the renal pelvis. This is in keeping with Plaggemeyer,⁸ who found that in cases of gunshot wounds of the spinal cord there was no back pressure from the residual urine.

The dilatation may be due either to paralysis of the nerves supplying the kidneys or to the abnormal position of the ureters as they enter the bladder. We believe the latter to be the most likely cause.

Plaggemeyer⁸ in all his cases of bladder paralysis due to spinal-cord injury found no vesical stones notwithstanding the constant residuals, the majority of which were infected. It is interesting to note that in the case reported here no vesical calculus was observed although the patient has had infected residual urine for at least twenty-four years.

The symptom of nocturnal enuresis should be considered of great significance by urologists. It is possible that in patients in whom this occurs there may be some early changes in the nervous system which can be recognized by the cystoscope. If, in these cases of bed wetting, the bladder walls show fine trabeculations and perhaps beginning relaxation of the internal sphincter a thorough neurological examination should be made.

The treatment of spinal cord bladders depends entirely upon the pathology found in the central nervous system. The bladder treatment of patients suffering with traumatic injury to the cord

is entirely different from that where the cord condition is due to some disease.

As a result of the sudden complete bladder paralysis produced by an injured cord, infection occurs easily and for that reason catheterization should not be performed. There may be acute distention for a few days, causing great distress to the patient, but in time the automatic bladder will develop: the patient will be quite comfortable and no infection of the urinary tract will result.

Since it is the ascending urinary infection which ultimately proves fatal, no instrumentation whatsoever should be performed upon a non-infected bladder.

On the other hand, if the disease in the cord is amenable to treatment, we should regard the bladder condition as a secondary one which will improve with the proper treatment after the primary lesion has been removed. In such cases the aim should be to keep the bladder clean and to retain its tone. If there is infection present the patient should be catheterized several times a week, the bladder should be washed with some antiseptic solution, and then some silver salt should be instilled. Urotropin given at intervals is of benefit in cases having large amounts of residual urine.

Muscle tone can be increased by instructing the patient to empty his bladder as completely as possible and to start and stop the stream at frequent intervals while voiding in order to strengthen those muscles which are not paralyzed.

This treatment has been of benefit in our patient. The nocturia and bed wetting have stopped entirely and the bladder urine shows very little pus. The residual is not much less, but urination is performed at the same hour every day, and in this manner no discomfort is experienced.

CONCLUSIONS

From a study of the case presented here and a review of the literature we have reached these conclusions:

1. In the early stages of poliomyelitis acute retention is sometimes a complicating factor.
2. Gross changes in the urinary tract may occur in chronic poliomyelitis which will give rise to the typical findings characteristic of spinal-cord bladders.

1195 Bush Street.

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OCULAR MELANOSIS—ITS SURGICAL AND RADIUM ASPECTS*

CASE REPORT

By P. OBARRIO, M. D.

AND
LOUIS C. DEANE, M. D.
San Francisco

MRS. H——, a seamstress by occupation, 56 years old when she first consulted us, February 1, 1923.

History—She tells us that since about the age of 24 she had noticed a black spot on the white of her right eye. This spot had the peculiarity that it would occasionally disappear only to reappear again possibly a little larger in size. These changes would take place without any treatment whatever.

Her family history, personal history, blood examinations, urine and all the other antecedents were negative. She was a well nourished, healthy person.

Condition When First Seen—On the supero-exterior quadrant of the right eye and encroaching on the corneal margin there was a tumefaction of the conjunctiva of about 6x4x3 mm. with possible attachments to Tenons capsule and the sclera.

The growth was highly pigmented and somewhat movable.

All of the conjunctiva, both bulbar and palpebral, was so highly pigmented that this pigment could be easily rubbed off with a bit of gauze or cotton.

The cornea, refractive media and the fundus were normal.

Refraction as follows:

R + 50 C. ax. 135° 20/20
L + 75 S. + 25 C. ax. 130° 20/20

TREATMENT

Under local anesthesia this growth was removed, the conjunctiva undermined to procure sliding flaps, and sutures were applied.

Shortly after this a very considerable portion of the pigment of the conjunctiva had disappeared.

Recurrence—It was not long before a secondary growth made its appearance, this time at the lower cul-de-sac.

During the development of this second growth the universal increase of pigment about the conjunctiva seemed to be in direct ratio to the extent and duration of the growth.

This growth was likewise extirpated only to recur once more in the immediate vicinity.

We felt at the time that as each extirpation entailed the removal of a considerable portion of the conjunctiva, that a repetition of this procedure would produce a vexing entropion through cicatricial contraction.

The patient did not return to us for a considerable period of time after the second removal of the growth. When she eventually returned, February, 1926, the condition of the eye was worse than ever; not only was there a recurrence of the growth at the lower cul-de-sac, but the pigmentation of the

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whole conjunctiva was extremely marked and active and in addition to this there was also quite a considerable mucoid secretion and an inflamed appearance of the whole eye. The vision, however, was not materially reduced, as the cornea remained transparent.

We decided to follow the next surgical procedure with the application of radium. It was thought advisable to have further counsel on this matter, and a prominent skin specialist, consulted by the patient, advised an immediate removal of the eye, with special emphasis on the fact that the orbit should also be eviscerated and that both the lids should be removed.

Some practitioners will remember this line of treatment is not unlike the practice observed by some of the old clinicians who consider border line melanotic growths of the eye as pre-eminently dangerous because of metastases or because of further invasion of adjacent structures.

Our very early medical training taught that a melanotic growth of the choroid or ciliary body called for an immediate enucleation.

Nevertheless we felt that before undertaking so drastic a measure we should follow our program of radiation.

The growth was once more removed and radium treatment immediately begun by Doctor Rodenbaugh.

Radium Dosage—Doctor Rodenbaugh used 25 mg. of radium salts in a bare tube with no filters. The length of time for each treatment varied between seven and ten minutes, at about 2 mm. distance.

The dates of the treatments and length of time for each treatment were as follows:

RADIUM TREATMENTS

	M. G.	Time	Area
4-22-26	25—bare tube	7 min.	3 areas on lower lid
5-16-26	25—bare tube	10 min.	1 area on lower lid
6-19-26	25—bare tube	7 min.	1 area on lower lid
8-11-26	25—bare tube	10 min.	1 area on lower lid
10-22-26	25—bare tube	6 min.	1 area on lower lid
4-1-27	25—bare tube	7 min.	1 area on lower lid

A few days after each treatment some reaction in the form of redness and lacrimation would follow, but no further discomfort. At one time the cornea lost a considerable portion of its epithelium, which, however, was restored nicely under treatment.

The appended reports of the pathologists leave no question that these growths were on the border line of malignancy and, as Doctor Ophüls very aptly expresses it, "in the case of melanomata one can never tell how vicious they are." Therefore the view that extensive surgery such as enucleation and evisceration was indicated was unquestionably justified before the advent of radium.

The last growth that appeared on the lower lid was a deep-seated infiltration which with the repeated applications of radium, assumed a globular form readily movable and apparently surrounded by connective tissue bands. This was easily removed through the conjunctiva.

Present Status—The extensive pigmentation of the conjunctiva has almost entirely disappeared; there has been no recurrence of any of the growths; the eye is quiet. There is a slight entropion and

the eyelashes of the lower lid have disappeared. There are remnants of some pigment infiltration in the upper part of the cornea.

Vision and refraction as follows:

R + 50 S. + 1 C. 145° 20/20
L + 75 C. ax. 130° 20/20

Conclusions—1. In view of the results obtained as well as those of other recorded cases, it does not now seem necessary or advisable to use extreme measures such as enucleation or orbital evisceration, in the presence of border line or even malignant growths of the conjunctiva or cornea or even of the interior of the eye.

2. Where growths are accessible they should first be surgically removed, followed by immediate radium applications.

3. Whenever growths show tendencies toward recurrence, irrespective of whether they are proven pathologically malignant or not, radium treatment should be given after removal.

4. Radium applications over the cornea are liable to produce exfoliation of the epithelium with more or less extensive ulcerations which, however, disappear after treatment.

5. We have then in radium, apparently, an invaluable therapeutic agent for safeguarding eyes which heretofore were considered hopelessly lost. This case, of course, will be followed for a considerable period of time in order to ascertain the permanence of the results so far obtained.

350 Post Street.

REPORTS OF THE PATHOLOGISTS

W. OPHÜLS, M. D. (Stanford University), states that it is a nonmalignant growth and his report follows:

Sections of conjunctiva show much pigment, containing star-shaped cells, in the upper layers of the connective tissue and considerable dark brown finely granular pigment in the basal cells of the epithelial covering. The upper layers of the epithelium are missing. The conjunctiva is otherwise normal. The surface epithelium is most intensely pigmented near the small tumor, which in the section measures about 2-3 mm. in diameter. It is situated in the connective tissue underneath the epithelium and consists of a delicate reticulum of connective tissue in which there are many lymphocytes and larger cells, with large protoplasmic bodies, and large vesicular nuclei. Many of the large cells are full of finely granular brown pigment. I did not find any mitoses in these large cells. Judging from the history of the tumor, it does not appear to be excessively malignant, but in the case of melanomata, one can never tell how vicious they are.

Diagnosis: Melanosis of conjunctiva; melanoma of conjunctiva.

*

G. Y. RUSK (University of California Hospital): Microscopic examination from each of the tumor masses show essentially the same picture. Superficially there is the epithelium of the conjunctiva of normal character supported on a thin lamina of connective tissue except in a few places where the tumor comes practically to the surface. The tumor consists of a mass of fairly uniform cells of moderate size and moderate amount of cytoplasm. There is remarkably little stroma. There is some interstitial hemorrhage and occasionally thin walled vessels are seen.

The cells of the new growth not infrequently show brown pigment in their cytoplasm. This pigment is considered to be melanin and it does not give an iron reaction. Mitotic division is fairly frequent while most of the cells conform to the average, occasionally, one with a large hyperchromatic nucleolus is seen. An occasional focus of lymphocytic infiltration occurs.

Since this case on two previous occasions was examined by Doctor Ophüls I took the opportunity to show the

present tissue to him and he expressed the opinion that the present material had the appearance of a somewhat more marked grade of malignancy than that previously examined.

While the growth is, of course, recurring and extending immediately beneath the conjunctival tissue, the specimens show none of the subjacent tissue from which an idea might be had as to the invasive properties of the growth.

Diagnosis: Melanoma.



PATHOLOGICAL REPORT

The report by C. Werner reads:

Mrs. H. M. H.—Pigmented Growth from Conjunctiva: The specimen consists of an irregular brittle, dark-brown piece of tissue, of 7 mm. largest diameter.

Sections show a structureless mass of large, clear polyhedral cells (average diameter 25 micron), a small percentage of them packed with a dark-brown granular pigment, which is also found scattered profusely between the cells. The nuclei vary greatly in size and shape, the majority containing two or more coarse nucleoli. Vitotic figures are quite frequent, some fields showing 3 or 5. The cell-mass is supported merely by a network of capillaries. At the margin of the new growth are some extensive fields of small round and plasma cells. The small neoplasm presents all the characteristics of a melanotic sarcoma. Against this diagnosis might be argued the long duration (reported fourteen years). Ewing, however, mentions a case likewise occurring in the conjunctival sac, of ten years' duration.

OSSIFYING HEMATOMA*

By JAMES B. BULLITT, M. D.
San Jose

DISCUSSION by Raymond G. Taylor, M.D., Los Angeles; Howard E. Ruggles, M.D., San Francisco; John D. Lawson, M.D., Woodland; Roscoe G. Van Nuys, M.D., Oakland.

IN presenting this case I am not attempting an exhaustive and general review of the subject, but am considering classification on the one hand and osteogenesis on the other.

There is some question whether the case I am to present should properly be designated as ossifying hematoma, or as myositis ossificans traumatica.

CLASSIFICATION

Myositis ossificans progressiva is clearly recognized as a general disease of progressive nature, beginning usually in early life, of unknown etiology, in which all, or many, of the muscles are slowly transformed into osseous tissue. The ossified man of the side show is an expression of this disease.

The second form of myositis ossificans is classified as *circumscripta*, the muscular osteoma, and appears at the site of repeated slight injuries or irritations; of this the "rider's bone" is the best known example.

The third form, localized to one site in the body, while produced by more than one etiologic factor, is most commonly the result of a single, severe, closed trauma, generally a contusion or a dislocation.

The term ossifying hematoma is frequently applied to the tumor resulting from this form of trauma. Thus Baetjer and Waters refer to seven-

teen cases occurring in the clinic at Johns Hopkins, sixteen the result of trauma received on the football field, the seventeenth from the kick of a mule, and all classified by them as ossifying hematoma.¹

They say: "This tumor does not belong to the tumor group, as it is inflammatory in origin. . . . We have already discussed this lesion in connection with scurvy."

They proceed: "Apparently what happens is as follows: the violent trauma evidently ruptures a blood vessel in the periosteum; the hemorrhage gradually raises the periosteum until the resulting pressure becomes greater than the blood pressure and the hemorrhage ceases. . . . In about three weeks calcium salts will be laid down in the periosteum and the hemorrhage beneath it will undergo organization with the deposit of calcium salts."

In differentiating this condition from malignant disease they say: "In hematoma, since the hemorrhage is limited by the periosteum, there is a definite, sharp calcium border, and . . . the calcium salts are more or less parallel to the shaft."

Finally, they say: "This condition must be differentiated from myositis ossificans."

Perhaps this definition of ossifying hematoma is the correct one, but certainly it would be most remarkable if Baetjer's seventeen cases, each following a single severe trauma, were all of this type.

CASES REPORTED IN LITERATURE

Noble describes these cases following a single severe trauma as myositis ossificans; singularly enough, however, he does not even refer to the condition of hemorrhage confined beneath the periosteum, although he does state that the organized blood clot is slowly transformed into cartilage and then into bone. From a limited review of this subject, the majority of writers have described these cases under the term myositis ossificans. The usual conception has been that periosteum and osteogenic cells have been carried up into the traumatized soft tissues by divided and retracted muscle fibres, where the blood clot has served as a nidus for the subsequent bone formation.

Noble² makes this point, in discussing differentiation from sarcoma, that the bony mass is at first separated from the bone shaft from which it has been derived, the x-ray showing a line of light separating the old and the new bone. Later attachment is secondary and accidental.

In the *A. M. A. Journal* for December 4, 1926, Stone reports six cases, under the term ossifying hematoma, all occurring in young athletes and all the result of a single severe trauma. He apparently recognizes that some confusion exists between ossifying hematoma and myositis ossificans traumatica, but considers his cases properly characterized as ossifying hematoma, because "they were all under the periosteum," that is, all the bony masses removed were covered by periosteum. His conception appears to be that, as result of severe trauma, there is bleeding next the bone, that the periosteum is pushed up and

* Read before the Radiology Section, California Medical Association, at its Fifty-Sixth Annual Session, April 25-28, 1927.

gradually stretched into various shapes, in which ossification takes place. He states: "Each tumor was bone entirely covered by periosteum. Muscle was attached to the outside, but not once was it found inside the mass. This should be ample proof that it is not ossifying myositis."

Stone describes the mass found at operation in one case as "extending downward in two pieces, much like a partly opened pair of wings." It is certainly difficult to conceive of a confined blood clot stretching an intact periosteum in any such bizarre manner. His conclusion, based on the specimens all being covered by periosteum, and not enclosing muscle fibres, will bear further scrutiny.

Experimental efforts to produce injuries to the periosteum, followed by bone formation in the traumatized tissues, have been uniformly unsuccessful. Even the transplantation of a scale of bone with periosteum attached into muscular tissue by Davis and Hummecut produced a disappointingly small amount of bone, which in time was absorbed. Berthier carried out similar experiments, chiselling pieces of bone off the shaft and allowing the muscles to draw them away. But the bone never grew much larger than the flap which was cut. Why, following trauma and contusion, these growths result in some cases, while in others they do not, remains not satisfactorily explained. It seems necessary to fall back on the old standby, diathesis, called by Virchow the "ossifying diathesis."

PATHOLOGY

In a brief paper appearing in *Surgery, Gynecology and Obstetrics* for September, 1926, Leriche and Policard advance some new ideas relative to fundamental principles in the pathology of bone. They state that in osseous metaplasia the cells do not play the part classically attributed to them; that the osteoblasts do not secrete directly osseous substance between the cells, but that the osseous transformation of connective tissue is a phenomenon independent of all cellular action, an interstitial and humoral process. I quote: "the periosteum has no true osteogenic action. In normal conditions it prevents the formation of bone. It checks osseous infiltration. All the fasciculated structures, as muscle fibers or connective tissue bundles, do likewise . . . all prevent any osseous growth perpendicular to their direction. The osseous trabeculae, which in these conditions run against muscle or periosteum, can on the contrary grow in a parallel direction. They never can go beyond these fibers."

These observations of Leriche and Policard are especially interesting in this connection when considered in conjunction with Virchow's "ossifying diathesis." They further state that "a local calcareous oversupply incites in the neighborhood the formation of new bone. In that manner (I still quote) it is possible to explain the formation of heterotopic ossifications—muscular osteo-

mata, etc." Whence comes the local calcareous oversupply is, however, not quite clear.

THE AUTHOR'S CASE

The case I have to report is as follows:

H. R., a high school boy of 18, suffered a severe trauma on the football field on October 2, 1926, to the lower third of thigh. There was immediate pain and a soft swelling at the site of the blow. After about three weeks it was observed that the swelling was becoming harder. Roentgen examination on December 3, two months after injury, disclosed a lightly calcified mass on inner side of femur five inches above knee joint, about $3\frac{1}{2} \times 6$ cm. in size, with apparent attachment of about two inches along the posterior, inner aspect of the bone. The density was irregular in character. The conclusion was reached that the shadow was that of a calcified body in the soft tissues. Clinically the mass was at this time movable, although apparently hinged at point of attachment to femur. The surgeon in the case removed the mass by incision on December 26, finding it made up of bone, and reported at the time that it seemed to be so definitely attached to femur as to require the use of a chisel. He considered it an exostosis.

Here, in passing, it should be remarked that the consensus of opinion is that these cases should not be operated on for six months or a year, as there appears to be a definite growth period; until this is satisfied, removal is frequently followed by recurrence. Radiograms of this date (April 20, 1927), however, show no appearance of recurrence.

Roentgenologically this case is neither very remarkable nor very unusual. It lends itself, however, to consideration of the question of classification in the first place, and to a speculation as to osteogenesis in abnormal situations in general.

In the matter of classification, I have no fault to find with the term "myositis ossificans circumscripta," the term applied to circumscribed bone formation in muscle, the result of repeated or long-continued mechanical insults, as the rider's bone of the cavalryman, the shoulder bone in the soldier from carrying the rifle. These are recognized as being in a class separate and distinct from the cases immediately following severe trauma where muscular tissue has been torn and injured with resulting hematoma.

Should these latter be classified as myositis ossificans or as ossifying hematoma? If Baetjer and Waters are right, only those cases should be classified as of the latter variety in which there is hemorrhage beneath an intact periosteum, with succeeding ossification of the blood clot, the bone in such case being laid down parallel to the shaft and beneath the periosteum. This is one point made in the differentiation from periosteal sarcoma. As already remarked, if all seventeen of Baetjer's cases were of this type it seems a remarkable coincidence. Stone apparently accepts this as a correct definition of ossifying hematoma, stating that the specimens removed at operation were all covered by periosteum. I think this statement has to be taken probably with some reservations.

On the other hand, the term "myositis ossificans" seems inappropriate to many of these cases. While muscular tissue takes part in the injury, the impulse to bone formation does not have its

inception in the muscular tissue, which remains entirely passive, the bony growth, whatever its origin, taking place into the blood clot, and growing into the muscular planes rather than being of them.

The pathogenesis of the ossifying myositis is still a much debated question; whether the bone tissue is derived from displaced periosteum or is the result of a traumatic aseptic myositis, causing a transformation of the adult mesenchymal tissue into the undifferentiated embryonal form, thereby changing its functional and chemical properties with consecutive heterotopic bone formation, is as yet not definitely decided. However, the latest investigations are more in favor of the latter theory.

I am indebted to Dr. Frederick Proescher, pathologist of the San Jose Hospital, for the following discussion of the pathogenesis of these formations of bone, and the microscopical examination of the specimen, which is appended:

"The rapid formation of muscle bones, and their partial recurrence after removing the primary growth, lead some investigators (Rokitansky, Cohen, and O. Weber) to the assumption of a blastomatous process. But the spontaneous stopping of the growth after it has reached a certain size, and its regression due to osteosclerosis and osteoporotic processes, speak against the blastomatous character. A recurrence after removing the primary growth does not speak for or against its blastomatous nature, since a complete removal of the ossifying tissue is not probable.

"At present there are two theories concerning the formation of muscle bones. Pochhammer, Sudeck, and others believe that only the periosteum is able to form bone tissue, while Gruber believes that inflammatory changes in the muscle without involving the periosteum of the bone may cause an ossifying myositis.

"On account of this divided opinion concerning the genesis of the muscle bones, different terms are applied to this disease—myositis ossificans or myopathia osteoplastica (G. B. Gruber) or periosteal callus formation (Sudeck).

"The following is a brief resumé of the ossifying process: Bone injuries are repaired by the periosteum and endosteum. The great productivity of the periosteum is clinically an experiment proven beyond a doubt. Numerous experiments have shown that detached periosteum cells may keep their vitality for at least seventy-two hours.

"There is no doubt that the periosteum is the chief bone-forming tissue, but numerous observations have definitely shown that connective tissue will also form bone tissue, as observed in the repair of fractures.

"The question arises, is the osteogenetic cell layer of the periosteum the only structure from which bone is derived, or may other tissues under changed conditions also form bone? The matrix for the formation of the bone structures is exclusively the mesenchyma. The original indifferent mesoderm in different localities not only forms bone and cartilage, but also smooth muscles, membranes, fascia, vascular endothelium, red and white blood cells.

"The original syncytial mesenchyma (Hueck)

forms a porous mass into which living cells are transposed. If the pores remain open the mesenchymal protoplasm forms reticular connective tissue, otherwise fibrillary connective tissue is formed.

"V. Korff and Hartmann as well as Hueck believe that the mesenchymal syncytium forms the basis for the chondro- and osteogenesis. Through certain mechanical influences the cellular-fibrillary substance is arranged in arcade-like formation, forming a network with more or less closed cavities. In these channels and cavities, through proliferation of the mesenchymal tissue, nuclei containing protoplasmic formations are deposited. Chondro- and osteoblasts, by a complete enclosure, are transformed into cartilage and bone corpuscles.

"At the same time the ground substance shows characteristic changes. It absorbs chondriotin sulphuric acid and forms cartilage, or it is impregnated with lime salts and becomes bone.

"Undoubtedly a certain undifferentiated stage of the mesenchyma can be transformed into cartilage and bone tissue, but not adult connective tissue. The connective tissue cell is in the adult bone transformed into bone cell; since it is surrounded by a firm substance it is unable to make further division, but the osteoblasts form always new layers of bone. Another mode of bone formation is characterized by the formation of cartilage which is later replaced by osteoblastic tissue.

"If a direct transformation of cartilage cells into bone cells is possible it is questionable, but so much is certain, that we have two kinds of bone formation. One is of connective tissue, the other of cartilage origin. There is no doubt that the connective tissue, in the form of embryonal syncytial mesenchyma, is able to form bone without an intermediary cartilage formation. This ability is due to the presence of osteoblasts which remain during the postfetal life in the osteogenetic cambium layer of the perichondrium and periosteum, also in a variable number in the bone marrow framework.

"The finding of ossifications in almost every organ of the human body proves that the connective tissue cells of the adult organism under certain functional and chemical influences may again acquire osteoblastic properties. We, therefore, can assume that bone formations in the skeletal muscles, if of traumatic origin, are not necessarily derived from misplaced periosteum but may be heterotopic ossifications which are genetic the same as true bone formations in the kidneys, lungs, aorta, or in scars of muscles. In summarizing we come to the following conclusions:

"The periosteum and endosteum of the adult organism are not the only matrices from which bone tissue can be formed, but under certain conditions the connective tissue may regain the ability to form bone. A definite ossification form is typical neither for the periosteum nor for the connective tissue; their osteoblastic abilities are not bound on a precartilaginous stage."

REPORT ON SPECIMEN

Microscopical Examination of Specimen—Embedded in a cellular tissue made up of dense fibrillary connective tissue, bone marrow and fat marrow containing many capillary and larger blood

vessels, are numerous bone trabeculae. The capillary vessels are surrounded by a few or a dense mass of lymphoid cells. The larger blood vessels are greatly engorged with blood. The bone trabeculae surrounding the marrow spaces are covered with a thin layer of osteoid tissue to which numerous osteoclasts are attached. Here and there are a few osteoblasts causing a moderate resorption of the bone trabeculae. Some bone trabeculae do not show lamellary formation, but the structures of immature bone tissue, consisting of irregularly arranged cells within the bone trabeculae, surrounded by a layer of osteoid tissue to which numerous osteoblasts are attached. The connective tissue in the immediate neighborhood contains a great many nuclei, forming an intermediate proliferation zone. A few bone trabeculae contain small islands of non-calcified cartilage cells. Of interest are some areas which are suggestive of an enchondral ossification, on the basis of calcified cartilage. The bone trabeculae are of irregular shape and made up of embryonal bone tissue containing small marrow spaces.

Garden City Bank Building.

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DISCUSSION

RAYMOND G. TAYLOR, M.D. (1136 West Sixth Street, Los Angeles)—Doctor Bullitt's comprehensive presentation of this subject and his rather complete discussion of the various theories and classifications leave but little to be said except to confirm his expressed deductions and opinions.

I have had the same experience in reference to being unable to reconcile the clinical and roentgen appearance of some of these lesions with the description given by Baetjer and Waters, and I feel with the essayist that their description certainly does not cover many of the lesions we see that are of traumatic origin. I have seen at least one rather extensive lesion of traumatic origin in the femur that certainly was not covered by periosteum. This recurred twice after removal, and after the third operation did not recur. The very limited experience we have had in observing these lesions leads us to believe that recurrences are probably, in most cases, due to incomplete removal.

✱

HOWARD E. RUGGLES, M.D. (Fitzhugh Building, San Francisco)—In Rosenstirn's³ extended discussion of myositis ossificans he calls attention to the fact that the posttraumatic and progressive forms of this unusual condition are identical in their pathology, both showing a progressive ossification of a pre-existing hemorrhage, the only difference being that in the traumatic cases the hemorrhage and the ossification are limited in extent.

A somewhat similar condition is also seen at times particularly about the elbow joint where there has been a dislocation resulting in hemorrhage which is followed by ossification.

Apparently the periosteum plays no part in this bone formation.

Doctor Bullitt is to be congratulated upon his presentation of this interesting condition.

✱

JOHN D. LAWSON, M.D. (Woodland Clinic, Woodland)—Doctor Bullitt has presented this subject with his usual thoroughness, and is entitled to much commendation on his effort.

These lesions which are rather typical are gener-

ally not difficult of diagnosis, which can be made only by roentgenogram.

Some confusion has existed in regard to the differential diagnosis between ossifying hematoma and myositis ossificans.

Stone especially holds to the view that all ossifying hematomas must be covered with periosteum. I think the majority of the men will not concur in this, inasmuch as these lesions may be noted somewhat distant from periosteum, and biopsy reveals no evidence of this tissue.

The lesions which we have noted have occurred during the second and third decades, because it is about this time that patients are subjected to violent traumatic agencies. They are much more common in the male for this reason.

Probably many cases of ossifying hematoma are passed up without diagnosis by the surgeon and internist for lack of roentgen investigation. Any disability following violent trauma to the soft tissues, which persists longer than one would ordinarily expect, should be very carefully investigated to show the presence or absence of this condition.

✱

ROSCOE G. VAN NUYS, M.D. (Oakland Bank Building, Oakland)—This excellent discussion of Doctor Bullitt's is certainly a contribution to the subject. My observations of this condition have been very limited. The two cases which I can remember having seen certainly did not seem to be of periosteal origin.

In the future I shall look for these cases with greater interest.

NON-TUBERCULOUS PULMONARY SUPPURATION*

By PHILIP H. PIERSON, M.D.
San Francisco

DISCUSSION by S. C. Davis, M.D., Tucson, Arizona; Harold Guyon Trimble, M.D., Oakland; Robert L. Cunningham, M.D., Los Angeles.

DURING the past decade there has been a pronounced tendency to classify as tuberculous a great many people suffering from chronic lung suppurations. This has had its favorable aspect, for it emphasized the importance of recognizing many signs and symptoms present in tuberculosis. But it also had a disadvantage which many of these waves of enthusiasm have, namely, of considering many patients as tuberculous who were suffering from some other disease. Within the last two years or so the pendulum has been swinging in the other direction, and there has been a desire to avoid the diagnosis of tuberculosis whenever it is not evident. The natural consequence will be a benefit to us all through a greater interest in studying these cases, and through a more careful and early diagnosis of tuberculosis, and patients will be benefited by receiving specific treatment outside of sanatoria for chronic infections. It is hoped that the data presented in this paper will help to clarify the symptom complex assigned to abscess, bronchiectasis and chronic pneumonia. Let us first consider pulmonary abscess.

PULMONARY ABSCESS

Many etiological factors have been mentioned, but for simplicity's sake, I will group the cases reported under five headings: Those due to aspiration, embolism, pneumonia, rupture of an

* Read before the General Medicine Section, California Medical Association, at its Fifty-Sixth Annual Session, April 25-28, 1927.

empyema and trauma. One of the most important helps in diagnosis of diseases of the lungs is a carefully taken history. Non-tuberculous disease is to be suspected in an adult whose infection has been chronic since early childhood. Some of these arise from the aspiration of a foreign body, and careful questioning will reveal this as an etiological factor. But it is not always possible to elicit this information on questioning, even if it is the cause. Roentgenologic study reveals opaque bodies and gives suspicious evidence on non-opaque objects, such as a kernel of corn, peanut husk, etc., which form a ball-like valve in a bronchus. As inspiration is stronger than expiration, air enters the lung beyond the obstruction, where its partial retention causes a localized emphysema, distal to the object.

In the group of abscesses here reported, six were the result of aspiration, and reference to the chart will show that there were several materials causing the damage—seawater, chicken bone, blade of grass, a piece of nasal bone following operation on the nose, septic material from the mouth—pus from an osteomyelitis of the jaw, and bloody mucus following tonsillectomy under heavy ether anesthesia. Following such aspira-

tion, there is generally a period of twelve to fifteen days, during which time, there may be no symptoms, or there may be the gradual onset of fever, malaise and an unproductive cough; towards the end of this time, chills and sweats are added to the picture, which persist until the abscess ruptures.

The history of the patient who aspirated seawater was briefly as follows: Prior to his fall from a ship, he had been well except for occasional "head colds." Following the accident, during which he was thoroughly chilled, he had a slight, non-productive cough, not relieved by medicine, for two weeks. He then began to have some chills and fever. On the twentieth day, this had reached 103 degrees F. and he expectorated foul sputum. Both temperature and sputum gradually subsided and he was practically well two months later. The anaerobic bacteria, probably the cause in this case, explain the long latent period.

Eleven of these abscesses were the result of emboli, three of which followed tonsillectomy, one each followed operation for cancer of lip, laceration of the face, disease of the gall bladder, acute appendicitis, fibromyoma of the uterus, hernia, stone in the kidney, and one was a postpartum embolus.

The history of the case of the abscess caused by a postpartum septic embolus from an infected vessel in the broad ligament is presented for comparison with the abscess caused by the aspiration of seawater. The patient, a woman of 30 years, entered the hospital for confinement of her fourth child on November 20, 1926. She had been having pain in her right lower quadrant for some weeks. Three or four days prior to and following her delivery, she had a temperature ranging from 100 degrees to 101.5 degrees F., this being due to a probable pelvic phlebitis, and on the fourth day she was seized with a sharp pain in her right lower chest, more pronounced with breathing. She had no cough or expectoration. Locally there was slight dullness, but no change in breath sounds. Within the next six days, during which time the temperature remained about 101 degrees, signs at the right base developed including dullness, diminished breathing and slight egophany. On this day, I aspirated one ounce of blood-stained, cloudy fluid. The breath sounds gradually became harsher and closer to the ear. On the 7th day of December she expectorated 150 ccm. of purulent sputum. Postural treatment was instituted, and within seven days expectoration had ceased and the patient was afebrile. A roentgenogram taken on the 7th day of December showed a definite cavity 1½ inches in diameter with a fluid level. Within four days this had become very much smaller and within three weeks it had entirely disappeared.

I think the importance of small emboli as factors in the production of postoperative complications has not received sufficient attention, or at any rate, not sufficient data has been kept to give us an estimate as to how often emboli

	Cured	Improved	Unimproved	Dead
Medical	15	10	3	2
Bronchoscopy ..	2	1		1
Surgery	10	4	2	4
Pneumothorax ..	3		1	1
Totals	30	15	6	4

ETIOLOGY

Pneumonia	10	Lobe
		LLL Improved
		RML Improved
		RML Cured
		RLL Unimproved
		RLL Unimproved
		LLL Improved
		LLL Dead
		RLL Unimproved
		RML Cured
		RML Cured
Aspiration	6	1 Posttonsillectomy
		1 Sea Water
		1 Blade of grass
		1 Nasal bone, post-operative
		1 Chicken bone
		1 Pus from disch. Osteomyelitis (jaw)
		LLL Cured
Embolie	11	1 Hernia
		RLL Cured
		1 Postpartum
		RLL Cured
		1 Kidney stone
		LLL Cured
		1 Operation on lip
		LUL Unimproved
		1 Appendix
		RLL Dead
		1 Gall bladder
		RLL Cured
		1 Laceration of face
		LUL Cured
		1 Fibroid
		LLL Cured
		3 Posttonsillectomy
		RUL Dead
		LLL Improved
Trauma	2	RUL Cured
		LUL Cured
Chronic Empyema	1	1 Fractured ribs
		LLL Dead

	AGE					
	Under 10	10-20	20-30	30-40	40-50	Over 50
	3	2	2	11	4	6
						2

Table 1—Results of Lung Abscess Cases.

occur following operations. A small, sterile embolus frequently breaks off from tissue which has been roughly handled or crushed, and on reaching the lung may cause very few signs or symptoms, provided the circulation in that part is good and there is no chronic infection present. In such instances, the patient may complain of a small amount of pain, there may be a slight rise in temperature, both of which are attributed to some other cause during the early days of convalescence. But if this embolus lodges in a portion of the lung where there is more or less congestion, a pneumonic patch will develop, which often undergoes necrosis with the formation of an abscess. An embolus from a septic field, such as was present in this case, frequently causes an abscess. Some writers have reported a proportionately large number of abscesses following tonsillectomy. It is possible that some abscesses are the result of aspiration of infected material into a part of the lung which is locally less resistant. Aspiration was apparently the cause of the formation of an abscess in one of my patients who was suffering from a chronic bronchitis, as the result of an upper respiratory infection when he was operated upon under a long ether anesthesia. The experimental work of Holman and Chandler leads us to believe that a great many of these posttonsillectomic abscesses following tonsillectomy are the result of infected emboli from the seat of operation, especially where there is infection and considerable crushing of tissue. In this series, four such abscesses were found, three of which I attributed to emboli, and the fourth to aspiration. The diminished frequency of abscess following tonsillectomy is probably due

to better administration of the anesthetic and to the suction apparatus devised by Sewell, which keeps the pharynx freer from blood and mucus. Bleeding is controlled by tying the vessels. This leaves a cleaner postoperative field.

Ten cases of pneumonia, all of the broncho-pneumonic type, resulted in abscesses. The important point, so far as the history with reference to pneumonia is concerned, is that a protracted fever recurring after the initial infection has apparently subsided, very often represents the formation of an abscess or the development of an empyema. Under this heading, I placed a few abscesses of which the etiology was not clear, although their history suggested pneumonia. In abscesses, as in chronic pneumonia, an infection in the upper respiratory tract plays an important rôle. This will be dealt with more fully later. The dullness, diminished or absent breath sounds and tactile fremitus found in parietal empyema may justify aspiration for diagnosis. If there is doubt as to whether empyema or abscess is present, do not push the needle too far and so enter the lung. Abscesses and interlobar empyemas should never be needled for diagnosis, unless there is visible evidence of adhesions between visceral and parietal pleurae. In one case of this series this procedure of needling was followed by empyema. This danger is too imminent not to mention it in the most disparaging terms.

The question has often been raised as to why trauma to the chest wall results in pneumonia, abscess or exacerbation of a tuberculous focus in some instances, and not in others. I do not know that anyone has been able to explain this conclusively. But the lowering of one's resistance

TREATMENT						RESULT			
Etiology	No.	Medical	Surgical	Pneumothorax	Bronchoscopy	Cured	Improved	Unimproved	Dead
Pneumonia	10	4	3	2	1	1 (RML) 1 (RML)	1 (LLL) 1 (LLL) 1 (RML)	1 (RLL) 1 (RLL) 1 (RLL)	1 (LLL)
Aspiration	6	2	3		1	1 (LLL) 1 (LLL) 1 (RLL) 1 (RLL)	1 (RLL)		1 (RLL)
Emboli	11	7	3	1		2 (RLL) 2 (LLL) 1 (LUL) 5 1 (RLL)	1 (LLL) 1 (RLL)	1 (LUL)	1 (RLL) 1 (RLL)
Trauma	2	2				1 (RUL) 1 (LUL) 2			
Chronic Empyema	1		1						1 (LLL)
Totals	30	15	10	3	2	15	6	4	5
LOBES									
R. U. L.	2								
R. M. L.	4								
R. L. L.	12								
SEX									
Male	18								
Female	12								

Table 2—Treatment and results following various types of lung abscess.

as a result of an accident, an irritation of the pleura with congestion of the underlying lung, in the presence of the pneumococcus, streptococcus or tubercle bacillus, is the most plausible explanation for the development of disease in the group of cases here discussed. Broken ribs are often treated very casually with adhesive strapping, but an accompanying damage to the lung should always be kept in mind, and repeated examinations of the lungs made to determine whether a resultant disease has developed.

Let me here stress the great value of a careful roentgenologic study in determining the location and character of all abscesses as well as the etiology in some instances. Before the rupture of an abscess, it is difficult to distinguish, radiologically, abscess from pneumonia. Following the rupture, winking of the cavity is seen fluoroscopically and a fluid level is usually present. Its disappearance following postural drainage, the regression of the pneumonic infiltration and of the size of the abscess are most clearly brought out by roentgenographic studies.

Repeated negative examinations of the sputum for tubercle bacilli in the face of considerable expectoration are in favor of a pyogenic abscess rather than of a tuberculous lesion. Elastic fibres in the early stage of an abscess are very often found when a thorough search is made.

THREE MAJOR FACTORS IN DIAGNOSIS

I feel that these three factors, namely, history, careful roentgenographic study and examination of the sputum are of prime importance in the diagnosis and treatment of pulmonary abscess. Physical findings are often very indefinite. If the abscess is near the pleura, the most constant signs are dullness, diminished breathing, which becomes bronchial as the pneumonic area progresses. After the rupture of the cavity, we sometimes hear an amphoric whisper, but this is not at all constant. Later on, râles appear, but in relatively small numbers. A centrally located abscess may give no physical signs, due to the overlying normal lung. A slight dullness is sometimes present. Hemoptysis has often been mentioned as pathognomonic of pulmonary tuberculosis, but in this series, there were definite hemoptyses of over an ounce in ten of the cases, and of some blood in practically all of the others. Tuberculosis may be localized either in the upper or lower lobes, which further confuses the differential diagnosis.

TREATMENT

As soon as the diagnosis of pulmonary abscess is established, whether before or after rupture, medical treatment is indicated for a period of time, its length depending upon the progress of the lesion and the ability of the patient to cope with the infection. Admitting that my series is small, which may lend a rather unfair aspect as to treatment in general, it nevertheless shows a mortality of $16 \frac{2}{3}$ per cent. Of fifteen cases treated medically, none died and only two were reported as unimproved, this being at least partially due to their refusal to submit to surgical treatment. Postural treatment is of

more value in acute pulmonary abscesses than in chronic abscesses, and should always be instituted for at least three or four weeks following the rupture of an abscess, and longer if needed, provided the patient is making satisfactory progress. If at the end of this period, no progress is noted, either as evidenced by diminution of temperature, amount of expectoration or improvement in general well-being, bronchoscopy should be considered.

I do not mean that one should delay bronchoscopy four to six weeks in cases in which either the history or roentgenogram gives evidence of a foreign body, since the removal of these, causes abscesses to clear up promptly. Its use at the time indicated is largely to remove obstructing granulation tissue and allow freer drainage. Patients treated by bronchoscopy have been temporarily very much inconvenienced by the procedure, and I fail to see the value therapeutically of the aspiration of a relatively small amount of pus once or twice weekly. In more experienced hands or in a larger series, this procedure may have benefits not at present apparent to me.

Pneumothorax has been recommended by some, including Edouard Rist, but when the abscess is close to the pleura, it is a dangerous procedure to undertake. Even in giving small amounts of air, a slight tear in the pleura frequently results in pyopneumothorax. Occasionally this air may be under pressure, the result of leakage in only one direction. In centrally located abscesses, it is indicated and often of great benefit. The case reported in this series, I would be inclined to call cured, had the patient not disappeared after about eighteen months of most favorable progress.

During the period of waiting, counter irritants over the affected part of the lung are helpful, and bed rest, plenty of fresh air and sunshine and a high caloric diet are needed to keep the patient in as good physical condition as possible. It is rare that drugs are necessary. Occasionally a mild expectorant may be used to save the patient from the tiresome effort of raising thick sputum, and sedatives may be necessary at night to insure sufficient rest.

In these cases where medical treatment has failed after a period of about four to six weeks, surgery is indicated. It is generally agreed that in the absence of adhesions, the two-stage operation is necessary. The first procedure is to resect

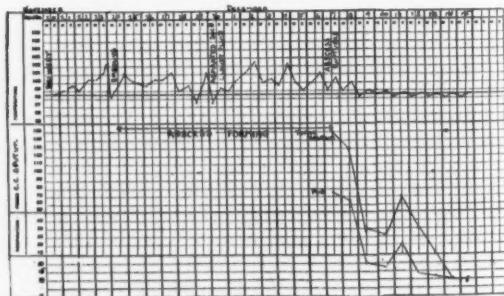


Fig. 2—Chart. Record of case quoted. Lung abscess due to septic embolus.

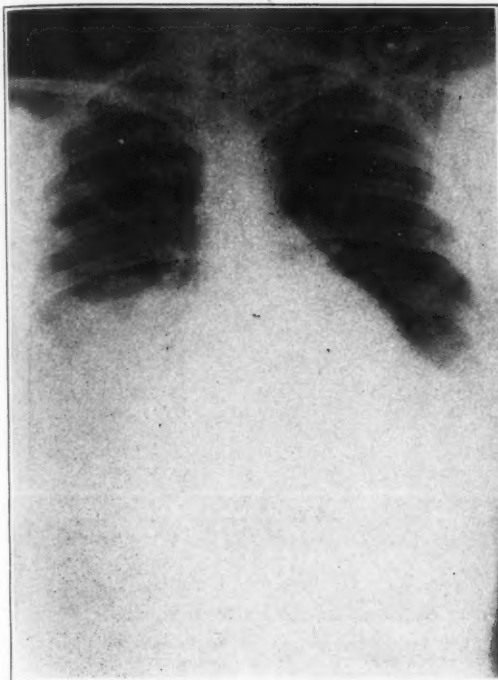


Fig. 4—X-ray of lung on December 7, showing abscess in right lower lobe with fluid level.

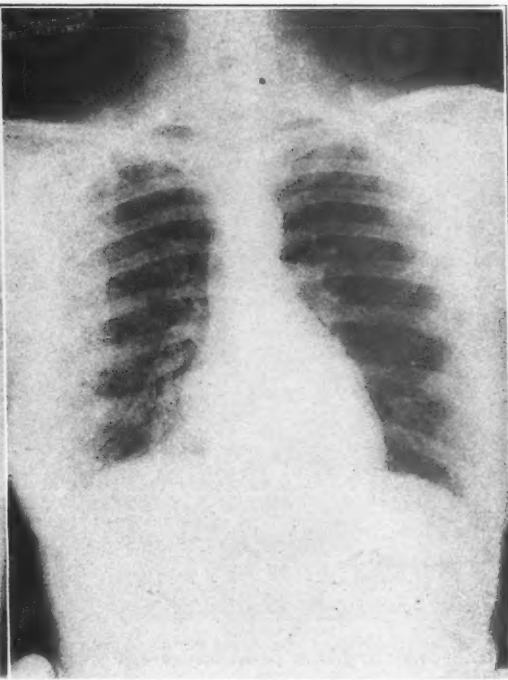


Fig. 5—X-ray of lung, same patient, February 1, showing complete disappearance of abscess shadows.

sections of one or two ribs and cause adhesions between the two layers of pleura, either by suturing or packing with gauze. After three or four days, incision with the cautery is made into the abscess and drainage is instituted. The mortality of this treatment in acute abscesses is relatively low and proportionately high in chronic abscesses, including those in which empyema has resulted. The bronchial fistula should be kept open for a considerable time so that thorough drainage may be obtained from all the small pockets surrounding the central abscess.

The after care is very essential, including sunshine, fresh air, high caloric diet, etc. For a year or more the patient must be very careful to avoid acute respiratory infections and whenever possible he should live in a warm, dry atmosphere.

To summarize, in regard to abscesses, let me say that a careful history is very important in defining the etiology of the lesion; the physical signs are very meager as compared with a tuberculous lesion of the same extent; the x-ray is indispensable for localization of the abscess and for a better knowledge as to the progress of the disease. Medical treatment should always be tried for at least four to six weeks. If no improvement is made by that time, surgical treatment is indicated. The mortality in general is low in acute abscesses but high in the case of chronic disease.

CHRONIC PNEUMONIA AND BRONCHIECTASIS

A large number of patients with chronic cough and purulent expectoration have been diagnosed as having bronchiectasis, but I feel that if a more

accurate diagnosis were made, some being classified as having a bronchiectasis and others a chronic pneumonia, our prognosis would be better in the latter group than in the former. First, let me describe the chief difference in the pathology of the two conditions.

Given a streptococcal pneumonia of the type so often seen associated with influenza, the infectious process is located in the peribronchial tissue surrounding the smaller as well as larger bronchi, and also invades the stroma of the alveoli. In some instances the infection weakens the bronchial wall, replacing some of the normal elastic tissue with fibrous tissue and by its dilatation, saccular cavities or cylindrical widening of the bronchi result. Chronic infection becomes implanted upon the mucous membrane divesting it of its normal epithelium, and a true bronchiectasis is produced.

Very often the infection while present in the peribronchial tissue extends by contact into the alveoli whose interstitial tissue is infiltrated and replaced by scar tissue, resulting in a fibrosis extending beyond the bronchial walls and throughout the parenchymatous tissue. The term "chronic pneumonia" is applied to that group of cases in which the fibrosis in the parenchyma predominates, at least relatively, over that surrounding the bronchi, and in which slight cylindrical dilation may be present or less often, saccular cavities. This pulmonary fibrosis without marked bronchial dilation generally does not cause the severe symptoms present in bronchiectasis. A mild phase of this fibrosis exists which is yearly represented by recurring attacks

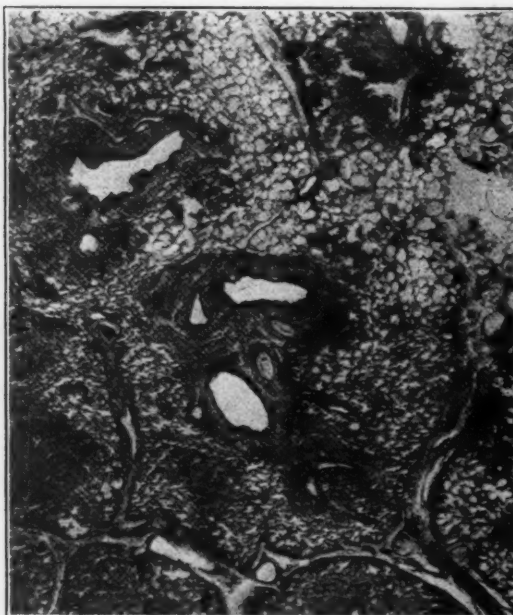


Fig. 6—Pathological section of chronic pneumonia. Note interstitial fibrosis predominating over bronchiectasis.



Fig. 7—Chronic pneumonia. Right base with "normal" lipiodol study.

of infection in the winter, disappearing in warm weather. On physical examination, a patch of coarse indeterminate râles are periodically found in the same place, generally disappearing some time after the symptoms of the respiratory infection have passed. As this type of infection resulting in fibrosis does not cause very marked shadows in the x-ray, nor sufficient distortion to produce a typically abnormal picture after the lipiodol injection, it is often overlooked. This mild form of chronic pneumonia can bear particular emphasis, because it is so often the seat of chronic recurring infections, attracting little attention. It is in this mild form while still in its early stages that upper respiratory infections from the sinuses and tonsils play a very important rôle. Repeated infections with involvement of this fibrous tissue cause a progressive disappearance of normal parenchyma, which is followed as a rule by a tendency toward bronchiectasis. Consequently, the early recognition of these changes and their correction will prevent subsequent damage which is irreparable.

In reviewing a considerable number of cases in private practice and in the Stanford Chest Clinic, it would seem that pneumonia, influenza and sinus infection play a prominent part as etiological factors. Whooping cough, and, less often, measles in childhood should also be mentioned.

TREATMENT

It is evident, then, that the early recognition of this gradual infectious process in the lung offers a considerable field for preventive measures. Local treatment is often of help, including among other things, diathermy and the radical clearing up of upper respiratory infections. A

change to a warm, dry climate is also very beneficial in preventing further progress. This is particularly true in children in whom with energetic therapy, the process clears up permanently.

Whenever there is retention of mucus or pus, postural drainage should be instituted. In the more advanced stages of this fibrosis, as well as in bronchiectasis, postural drainage is of some benefit, but it does not have the lasting effect obtained in the earlier stages of the disease.

Improving the general health of the individual is of value. Sun baths, either natural or artificial, regulation of diet, proper exercise and plenty of rest are essential. In advanced cases of bronchiectasis, or chronic pneumonia, medical treatment may alleviate symptoms but rarely eradicates the disease. In spirochetal infections, as well as in some bacterial infections, salvarsan may be distinctly helpful. Patients may be made more comfortable by emptying these pockets by postural drainage at certain times during the day, an endeavor being made to prevent their overflowing and infecting neighboring tissue. This will relieve them of the constant cough and expectoration which makes them so unacceptable in society or in a gainful occupation. Here again, bronchoscopy has been recommended by some, with great benefit, due largely, I feel, to the removal of granulations and better drainage with posture.

Of forty cases treated with autogenous vaccine, 50 per cent were distinctly relieved of cough and expectoration for varying periods. This seems to be the extent of its therapeutic value; but even this to a person with such distressing symptoms as are present in this group of cases, is very welcome. Unfortunately, the disease is bilateral

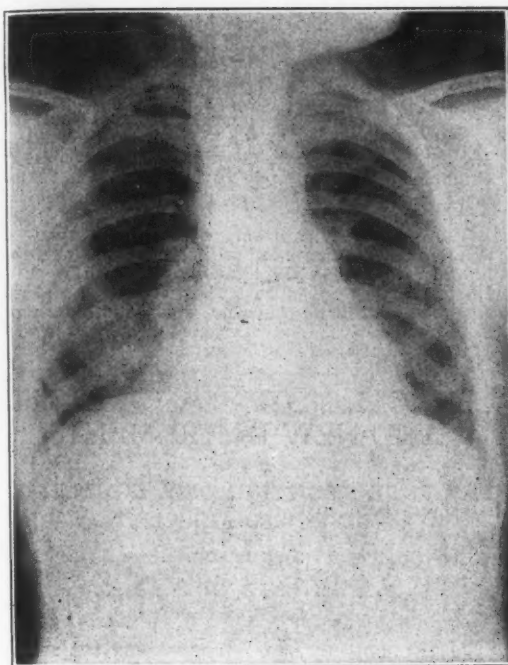


Fig. 8—Base of right lung of child with chronic pneumonia of six months' duration.

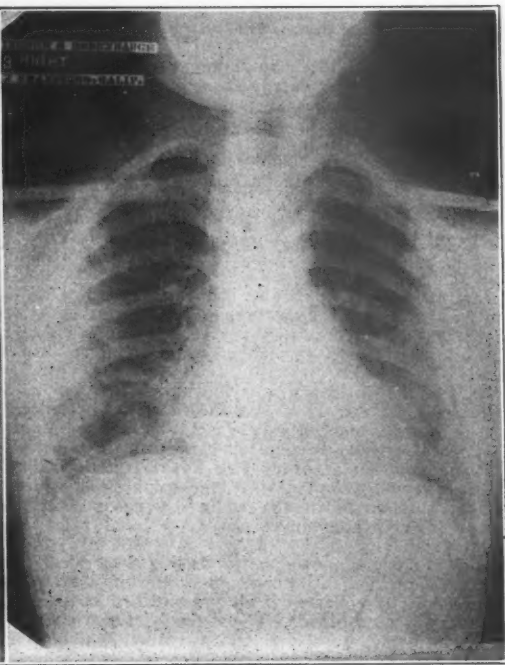


Fig. 9—Same, six months later. Note clearing at right base.

in a large proportion of cases. Whenever a unilateral condition exists which does not improve with medical treatment, surgical measures are indicated which may consist either of thoracotomy with drainage of one or more large cavities, or of Graham's cautery lobectomy. Opinions differ as to the value of this procedure because of the considerable risk of hemorrhage and cerebral emboli, but theoretically it has many advantages. Extrapleural thoracoplasty may be of value in unilateral cases, together with avulsion of the phrenic nerve, which offers a means of compressing the affected lung. Benefits from pneumothorax are very few and have the same disadvantage as previously discussed under pulmonary abscess.

A few words should be said with regard to lipiodol. Its use has been very helpful in distinguishing true bronchiectatic cavities, with marked cylindrical or saccular dilatation from a diffuse fibrosis. Its administration is relatively simple, requiring only at time a small amount of local anesthetic in the pharynx and larynx, the warmed oil being dropped slowly down through the larynx, while the patient holds his own tongue in full extension. Before the procedure is started, I feel that it is very important to prepare the patient by postural drainage of the cavities for at least one hour. Then the patient should undergo no exertion from the time he receives the lipiodol until the picture is taken, for exertion often starts a paroxysm of coughing and expectoration of the oil.

Summarizing our considerations of bronchiectasis and chronic pneumonia, the early recognition of the latter disease, the energetic treatment of

upper respiratory foci of infections, local treatment and attention to general health will often offer a better prognosis in chronic pneumonia alone than when associated with bronchiectasis. A negative lipiodol study, if carefully carried out, gives evidence against bronchiectasis and in favor of chronic pneumonia. Postural treatment and autogenous vaccines make life more bearable for the inoperable cases of bronchiectasis, while in unilateral disease, surgical treatment offers increasing hope of alleviation of symptoms and cure of the disease.

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DISCUSSION

S. C. DAVIS, M.D. (27 South Scott Street, Tucson, Arizona)—I have never heard this subject so ably discussed. Non-tuberculous pulmonary pathology is especially of interest to us, located as we are, where many come to find the mild, dry climate that Doctor Pierson speaks of in his treatment. Especially are we interested in the chronic pneumonias and bronchiectasis and our opinion that some of the cases that are reported to have repeated attacks of pneumonia, the pathology is none other than an acute inflammatory condition of the lung tissue surrounding a bronchiectatic process.

Many such cases of pneumonitis remain practically free of attacks while residing in Tucson.

We are very cautious in making or corroborating a diagnosis of tuberculosis in basal pathology unless we have a positive sputum.

We hope many will have the opportunity of reading this paper, which covers the subject in detail and be benefited to the extent that many cases previously diagnosed tuberculous will be properly cared for.

✱

HAROLD GUYON TRIMBLE, M.D. (707 Latham Square Building, Oakland)—There is nothing I can add to this splendid paper. It gives in detail the current thought on these relatively common types of lung infections. There are some points I feel sure that

Doctor Pierson would have elaborated, had space permitted.

Carefully controlled heliotherapy, preferably natural sunshine—the various lamps being only a substitute—is of definite value even during the more acute phases of lung abscess. In the chronic stages of all the non-tuberculous lung suppurations it is of marked benefit. The direct effect on the lung itself may not be marked, but the general improvement in the patient's condition is usually such that if surgical measures are indicated, the attending shock is greatly minimized. This type of therapy is particularly neglected by surgeons who have not the opportunity of frequent contact with a chest consultant.

In chronic pneumonia and bronchiectasis the "radical clearing up of upper respiratory infections" is fundamental and frequently neglected. One can have but little hope of a permanently successful result if this is overlooked.

Drugs offer little except symptomatic relief in all of these infections. However, the time-honored creosote is often of marked value in chronic pneumonitis. It is best given as guaiacol carbonate in 5-grain capsules as often as every two hours. Occasionally this is not well tolerated—then the soluble potassium guaiacol sulphonate in the same dosage is usually accepted. This sometimes clears up basal râles of months standing.

For autogenous vaccine we are using the "selective pathogen" method of preparation (culturing a sample of the carefully collected fresh sputum in a sample of the patient's own blood). Theoretically, those organisms will grow most abundantly against which the patient has the least resistance. Practically it seems to work. This method has given us decidedly better response, as judged by the focal reaction, during the three years it has been used.

In closing, I would make a plea for the use of surgery, not as a last resort, but judiciously, in properly selected cases, after careful medical supervision alone, has failed to achieve a satisfactory result.

✱

ROBERT L. CUNNINGHAM, M. D. (506 Medical Office Building, Los Angeles)—For many years, emphasis was laid upon the early diagnosis of pulmonary tuberculosis and the tendency was to designate as tuberculous conditions which possibly were not really such. This was amply illustrated by the large number of men rejected for service in the army and navy during the war as being tuberculous, who were later found to have some other pathological condition. The prevalence of influenza and kindred infections since 1918 has also given rise to a host of pulmonary conditions which were rare or unrecognized before. These circumstances, together with new refinements in the technique of study and more critical observation, may account for the increasing frequency with which non-tuberculous pulmonary suppurations are now demonstrated and for the many excellent papers appearing upon this subject within the last two or three years. I have read with interest many splendid contributions but can recall none covering the field more adequately than does this presentation by Doctor Pierson.

In this paper, there is material for an extensive monograph. The one paragraph upon foreign bodies in the lung might well be expanded to an interesting chapter, while aspiration, pneumonia or pulmonary embolism offer equally inviting opportunities. Doctor Pierson has shown great restraint, which, I trust, simply means that he intends to treat those questions more fully later.

A diagnostic point, which has seemed to me of value in hinting at intrapulmonary abscess rather than pneumonia or empyema when differentiation has been in question, is the presence of pain referred to the shoulder or acromion process on the affected side. It always makes me suspicious because of the frequency with which I have found it in proven cases of pulmonary abscess but seldom elsewhere.

Under the treatment of abscess, Doctor Pierson does not mention the injection of lipidol either

through the bronchoscope or by intratracheal instillation. We have noted marked benefit following its use, though in suspected tuberculous abscess, it is to be shunned. Otherwise the therapeutic measures described seem complete. The importance attributed to postural drainage is most gratifying; it is a measure of the greatest importance and one too often neglected. My limited employment of vaccines has given me no enthusiasm for that mode of treatment, but I shall make further trial of it because Doctor Pierson has found it helpful.

Those who suffer from any of these types of pulmonary affection need all of the help available in order to render life tolerable and such work as Doctor Pierson has given us is encouraging and will stimulate us to better efforts of study and more thorough trials of the various methods of treatment indicated in this splendid report.

CLINICAL NOTES, CASE REPORTS AND NEW INSTRUMENTS

THE RECONSTRUCTION OF A COMPLETELY DESTROYED AURICLE*

CASE REPORT

By HARRINGTON B. GRAHAM, M. D.
San Francisco

THE opportunity of reconstructing the auricle occurs so infrequently that the operator seldom has a chance to learn how to improve his technique from personal experience. He must look to the description of the operation by others and so far the errors one may fall into have been very casually dealt with. I am attempting to describe two cases, one of my own, and the other by Dr. George Pierce of San Francisco, quite differently done, both of which could have been improved on by experience.

TECHNIQUE

The important factors involved in the operation are:

1. The tissue used must be in appearance and consistency similar to the original ear.
2. The support must be sufficient to keep the new tissue erect and away from the skull.
3. The new ear should be as thin as it is possible to make it.

If the tissues behind the ear have been uninjured, they are available for the reconstruction and even the hairy parts may be used, as they may be folded back so as to bring the hair onto the posterior surface, where it may be easily kept short. If this tissue is not available, the whole ear must be reconstructed from the skin of the chest, abdomen, or arm, none of which has the appearance of the original ear and can in no wise be as satisfactory as the scalp tissue.

The support may be celluloid, in which case there is a grave chance that it may later on be extruded. Of course, its thinness and maleable quality is a great asset. Personally, I prefer cartilage and have found the nasal septal cartilage satisfactory. The assertion that this is absorbed more frequently than is rib cartilage, has not been found to be true in my nasal plastic work;

* Read before the Pacific Coast Ophthalmological Society, Spokane, Washington, June, 1927.



Third stage. Lower border stitched to lobule

Second stage. Upper border stitched to anterior portion of canal

Fourth stage. Completed ear

either may be absorbed, the determining factor being unknown to me. Gillies has suggested using rib cartilage in order to be able to excavate it so as to provide a support the shape of the former ear, but this does not appeal to me, as it is a difficult task and the shaping might increase the tendency to absorption. It is hard to get a piece of rib cartilage as thin as septal cartilage, and this is a very important factor, as far as the cosmetic appearance of the ear is concerned.

The thinness of the new tissue will depend to a great extent upon the position subcutaneously of the transplant. If it is buried deeply in the tissues, the result must be a thick ear. A superficial position is a difficult one to obtain, but will pay the operator for his pains. Any tissue taken from the arm or chest must be thick, looking like a piece of putty when transplanted. However, time modifies its appearance so that under certain circumstances it may be permissible to use it.

CASE REPORT

My case was injured in a railway accident, the patient losing all but a portion of the lobule of the left ear. The tissues on the scalp were undamaged so that I could use the non-hairy parts for the reconstructed portion. My first step was to transplant a piece of septal cartilage the shape of the sole of a shoe to the subcuticular tissues posterior to the defect. I placed this directly behind the defect instead of above and behind, so that when I brought my tissues forward I did not have enough support to keep them high enough. Any cartilage either from the nose or rib, used to keep the soft tissues up and away from the head, should lie, by preference, in the upper one-third of the completed ear. It is difficult to get enough nasal septal cartilage to fill the demand, so that the lower portion of the lobe may have to be disregarded.

After leaving the cartilage in place for a month, I made a circular incision to the hair line, starting at the upper anterior part of the old ear. This incision was carried to the periosteum and the skin thus outlined, including the cartilage, was raised and folded in such a way as to have the upper border of the ear covered by a continuous layer of skin. The anterior portion was now sewed down to the tragus, and the defect on the scalp remedied by the customary undermining, reduction in size of the opening, and a skin graft taken from the leg, which was brought well up onto the back of the new flap. Were I to do another I should not fold the upper edge back, as in this case, but would use it entire, placing a graft over the whole posterior surface. This flap, if the cartilage were prop-

erly placed, would be quite sufficient to form a new ear without any further addition.

After another month the lower part was incised, carried forward and sewed to the freshened lobule, another graft being placed posteriorly. A few minor operations were done to smooth things out, and an attempt made to stiffen the upper border somewhat by the introduction of celluloid. This should not have been necessary.

Doctor Pierce proceeded quite differently with the reconstruction in his case. He transplanted the rib cartilage, placing it in position subcutaneously through a small incision above the ear. After six weeks a complete incision was made, outlining the new antihelix, which was then raised from the periosteum and a skin graft placed so as to cover the whole denuded surface, with stent in the center. The edge was then sewed back into its place of origin and again freed after ten days. He then brought a tube pedicle flap from the chest up to back of the ear and draped this over the new edge, forming a new helix, which is quite effective. This procedure enlarges the ear so that it is fully as large as the other, and when completed will be nearly the same shape.

The ear that I constructed is considerably smaller than the normal ear, due to the fact that I did not carry my incision high enough on the head, that I folded too much tissue back in order to get a smooth border, and that my cartilage was not placed high enough. All of these errors should be avoided in future work. The assertion of one author that no reconstructed ear is worth while is certainly a false statement, and the time is coming when we will be able to replace a destroyed ear by one which is nearly the equal of the original. Concentrate this work in the hands of a few surgeons and the technique will soon be developed satisfactorily.

490 Post Street.

PARAPHARYNGEAL ABSCESS WITH COMPLICATIONS

CASE REPORT

By ROY F. NELSON, M. D.
Oakland

ABSCESSSES of the deep fascial planes of the neck can give rise to such grave complications that they are always ominous. This case ran the gauntlet of complications except for thrombophlebitis and mediastinitis, which are nearly always fatal, and his recovery seems worthy of record. Endoscopic surgery succeeded after external attack had failed.

The patient was transferred to the bronchoscopic clinic of the department of otolaryngology

at Stanford University Medical School, January 10, 1927, with the following history:

Mr. H., age 48, baker.

Previous Entry, 1922—Diagnosis: acute bronchitis, chronic endocarditis (aortic and mitral), chronic myocarditis (compensated), hypertension, and obesity.

Present Illness—Complained of sore throat, pain along left side of neck for two weeks. Seen in the outpatient dispensary January 3, where an acute pharyngitis and mild tonsillitis accompanied by pain in left side of face and left ear and tenderness in left anterior cervical triangle were treated with local applications and hot gargles. No deep induration was noted externally or in the hypopharynx at that time. Temperature was 101. January 4 and 5, he felt better, but temperature was 102. January 7, he developed an acute generalized arthritis and was hospitalized on the medical service. Throat felt no worse, but pain and tenderness in neck were increasing; temperature, 102.4/10, and a dusky color of the pharyngeal wall was noted. Heart lesions were unchanged and well compensated for. Edema of the postpharyngeal wall, posterior pillars and uvula developed January 8.

Treatment—January 9, the surgical department thought there was a deep cervical abscess at the level of the thyroid cartilage, primarily on the left, and explored this region through an external incision, finding nothing but some edema of the deep tissues around the larynx and esophagus.

January 10, the patient had great dysphagia, respiratory stridor of laryngeal type, temperature 102. Examination by the nose and throat department revealed a marked edema of the posterior and lateral pharyngeal walls, increasing downward and obscuring the larynx except for the epiglottis, which was inflamed and tilted to the right, and the posterior surface of the arytenoids, which were somewhat edematous.

Direct laryngoscopy under local anesthesia showed the edema to be much greater on the left, including the left arytenoid, and greatest near the base of the epiglottis. The left pharyngoepiglottic fold was extremely swollen, fiery-red as compared to the pale edema elsewhere, tense and elastic rather than soggy, and this swelling was displacing the upper laryngeal structures to the right. An incision on the lateral pharyngeal wall about one centimeter above the base of the epiglottis opened an abscess at a depth of a few millimeters, and about an ounce of creamy yellow pus under great pressure was evacuated immediately into a suction tube. Cultures showed hemolytic streptococcus. It was hoped that the respiratory difficulty might soon subside, but two hours later the patient was becoming cyanotic and stuporous, and bedside tracheotomy was done with immediate relief.

Course—The next day, January 11, the arthritis was gone and a soft diet was being taken. Temperature fell to 101 rectal.

January 13, spots of bronchopneumonia appeared and fever and profuse bronchorrhea were present for several days, but pain and dysphagia were completely gone.

January 14, tracheotomy tube was removed.

January 20, temperature was normal and patient went home.

Tracheotomy wound healed slowly (secondary infection with *B. pyocyaneus* intervening), but completely by February 11, and patient returned to work.

COMMENT

Direct laryngoscopy at the first evidence of pharyngeal edema might have brought this serious illness to a satisfactory end without the external operation and before edema of the glottis necessitated tracheotomy, and the pneumonia might have been avoided. The myocardium maintained compensation during several hours of partial asphyxia, but had it failed the tracheotomy

might have been too late. Direct laryngoscopy is indicated in acute or chronic processes affecting the hypopharyngeal region before external attack is attempted.

1904 Franklin Street.

TERATOMA OF MEDIASTINUM*

REMOVAL UNDER NITROUS OXID-OXYGEN

ANESTHESIA

CASE REPORT

By MARY F. KAVANAGH, M.D.

San Francisco

THE following notes were taken from the history record of Mr. G. J., age 19, occupation a tractor driver, who was operated on by Dr. Wallace I. Terry, for removal of a teratoma of the mediastinum at the University of California Hospital.

Family History—The patient's parents are living and well. He has four sisters who are all perfectly healthy. Habits are negative. No history of accidents or of surgical operations. Has had an occasional cold.

Present History—Very sick-looking boy. Height, 5 feet 11 inches; weight, 155 pounds; temperature, 38.8; pulse, 112. For the past year he has had occasional attacks of pleuritic pain, mostly in the right side, occasionally in the left side. Cough began four weeks ago which keeps him awake at night. He raises considerable purulent sputum, but has no hemorrhage and no night sweats.

Physical Examination—Examination of eyes, nose, mouth, and neck negative. No lymph nodes felt anywhere. No cyanosis. No clubbing of fingers. Chest symmetrical and moves equally. No enlarged veins. No bulging. No pulsation. Apex beat cannot be felt. Premittus increased in right upper lung. On percussion the whole mid-right chest anteriorly shows diminished resonance, which cannot be separated from the right border of the heart—a dullness which may be heart dullness. This heart dullness brings it to the anterior axillary line. Apex beat is not definitely made out. The heart sounds heard over this area are very faint. Sounds at base are louder than anywhere else. No murmurs. Pulse regular and of good quality. Blood pressure: systolic, 125; diastolic, 75. Reflexes normal. There is a slight amount of dullness at the base of the right lung posteriorly and there are a few squeaking râles at both bases.

The blood count showed: hemoglobin, 85 per cent; red blood count, 4,960,000; white blood count, 8650; polymorphonuclears, 75 per cent; small lymphocytes, 20 per cent; large lymphocytes, 4 per cent; transitionals, 1 per cent.

The blood Wassermann was negative.

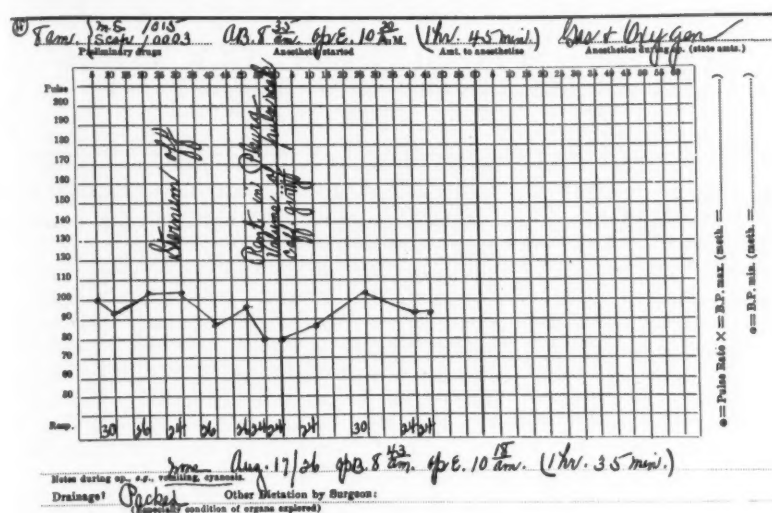
Urine had a trace of albumen.

August 12, 1926—Patient entered the hospital on the medical service with a diagnosis of purient pericarditis and dermoid cyst of the mediastinum having been made.

August 13, 1926—a pericardial tapping was done and 245 cc. of fluid was removed. The temperature dropped to normal after this tapping and an x-ray showed the cardiac shadow smaller than before the paracentesis, but there was no change in the shadow extending out into the lung field. The patient was transferred to the surgical service, and four days later the following operation was performed:

August 17, 1926—Operation: An incision was made from the level of second to fifth rib in the middle of the sternum. The right half of the sternum was resected, exposing a tumor involving the entire medias-

* Read before the Anesthesiology Section of the California Medical Association at its Fifty-Sixth Annual Session, April 25-28, 1927.



tinum. The mass was incised and a large quantity of fluid exuded. Character of the fluid, thick, cloudy, greasy, odorless, and containing particles of sebaceous material which resembled sulphur granules. After exploring the cyst cavity and evacuating the cavity the cyst was found to be a multicellular one. The dermoid and its pedicle were isolated on the posterior lateral wall of the cyst. This was removed and also as much of the cyst mass as possible. During this stage of the operation a small rent was made in the pleura near the lateral extension of the tumor, and a small amount of air was drawn into the pleura by negative pressure. This accident was followed by a more shallow respiration although there was no change in the respiratory rate, and there was also a drop in the pulse rate. Pulse remained regular, but the volume was quite weak. Caffein 3 grains was then given. No cyanosis was present at any time. A further extension of the cyst was found directly posteriorly between the right lung and the pericardium. Manipulation in this area caused the volume of the pulse to be most changeable. The remaining portion of the cyst cavity was lavaged with sterile water and the cyst cavity packed. Patient at the end of the operation was awake, talking, and in very good condition. Pulse was 92; respiration, 24.

Patient had a rather stormy convalescence. Complications and procedures which followed were:

- (a) Postoperative hydropneumothorax.
- (b) Draining of sternal sinuses.

August 27, 1926—Ten days after operation thoracentesis was done in the eighth interspace in the posterior axillary line and 40 cc. of fluid obtained.

August 31, 1926—Two weeks after operation patient was up. No evidence of respiratory embarrassment present. Temperature, 37-38; pulse, 100-120; respiration, 20-25.

September 20, 1926—Patient was discharged and instructed to return for a second operation.

November 16, 1926—It was interesting to note the difference in the picture which the patient presented today in comparison to that on his first operation. There had been a wonderful improvement in his general condition and he had gained twenty-one pounds in weight. He looked well and he was happy to know that he was ready for the second operation. Under nitrous oxid and oxygen anesthesia the tumor mass was explored and it was found to be well out on the chest; and by traction the base of the pedicle was exposed. A Peon hemostat was clamped across the base of the tumor cutting off the blood supply. By

this method of traction the mass was finally excised at its base.

November 24, 1926—
Eight days later the patient was discharged in very good condition.

I have reported this case because this was the first patient to whom I had given a nitrous oxid and oxygen anesthesia for removal of a tumor of the mediastinum. The Ohio monovalve gas machine was employed. By the usual inhalation method fifteen pounds pressure was used to anesthetize the patient and then raised to twenty-five pounds pressure

just before the right sternum was reflected. Complete surgical anesthesia was maintained throughout the operation. There was no cyanosis at any time. The accompanying anesthetic record shows that the patient's condition while under the anesthetic was very good when the type of operation performed is taken into consideration.

1020 Union Street.

A "Use" for Criminals—Individuals who forfeit their rights to life by committing capital crimes should be compelled to enlist their physical faculties in the cause of science, Dr. W. D. Haines, Cincinnati, believes.

"A Cincinnati surgeon, Dr. W. D. Haines," the Cincinnati *Times-Star* explains in a current editorial, "suggests that criminals condemned to death or life imprisonment for capital crimes be turned over to hospitals and laboratories for purposes of scientific medical experimentation. In this way, he says, methods might be found for curing cancer and other diseases which are now incurable in their later stages and against which little progress is being made with the field of experimentation limited to rats and other small animals."

"The suggestion," the *Times-Star* believes, "is worthy of consideration. On first thought it may appear a little barbarous. Probably it will not be put into effect in our time, for we are a sentimental people and there would be a great sob outcry against it."

"In its effect on crime, the establishment of such a custom might have important results. Lax enforcement of the laws and too great activity by pardon boards cause many criminals to think that they can pursue their evil practices in comparative security. Let the idea get around that a man convicted of murder is going to be used as an experiment station for discovering the manners and customs of dreaded disease germs and there would probably be a sudden surge toward virtue among the criminal classes.

"It may well be argued that a man who has forfeited his claim to life through the murder of a fellow-being might be made of some use to society rather than merely to be sent uselessly to the electric chair. Three or four centuries from now Doctor Haines' suggestion may be the general practice in the United States. But then again America may have become quite civilized by that time so that murder will no longer be a general practice in the United States."—*Ohio State M. J.*

BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An open forum for brief discussions of the workaday problems of the bedside doctor. Suggestions for subjects and discussants invited.

IMPRESSIONS AND PREJUDICES REGARDING OPERATIVE PROCEDURES IN CASES OF PULMONARY TUBERCULOSIS*

Robert A. Peers, Colfax—Patients suffering from active pulmonary tuberculosis or from tuberculosis which has recently been active not infrequently develop complications requiring operative surgical interference. In addition they are subject to the same degree as the non-tuberculous to disease and accident calling for surgical intervention. Sometimes the necessary surgery is distinctly minor; but at other times major surgical operations are indicated. The tuberculosis specialist who over a period of years sees many thousands of tuberculous patients including a great number upon whom surgery has been performed or for whom surgery is indicated and has been suggested, comes in time to entertain opinions of value to the surgical consultant. Likewise he receives and retains impressions, if he is observant and open-minded, which are of great assistance to him in forming an opinion as to the risk or safety of performing operations. Also with the passing of the years he, perhaps, accumulates prejudices against the employment of certain surgical operations in the presence of active, or recently active, tuberculosis. He is able to cite many cases which have come under his observation which support these impressions and prejudices, and he may or may not be able to produce satisfactory statistics supporting them. At any rate these impressions and prejudices remain and influence his opinion when consulted regarding the desirability or advisability of operation in a given case.

It is the intention of the writer to here outline some of his own impressions received during an experience of twenty years in the treatment of tuberculous patients.

It is perhaps trite to remark that patients with active pulmonary tuberculosis or recently active pulmonary tuberculosis are not the best surgical risks. It is self-evident that patients with extensive and acute disease should not be submitted under any circumstances to the shock of surgery unless absolutely imperative. But circumstances do continually arise where minor and major surgery must be considered in patients who are progressing more or less favorably and in whom the outlook, from the tuberculosis point of view, is encouraging. The surgeon then wishes

the opinion of the tuberculosis specialist as to the probable influence of surgery upon the patient's tuberculous lesion.

What will be the effect of a general anesthetic? Should the operation be done under local anesthesia or spinal anesthesia? If a general anesthetic is used what is the anesthetic of choice? Will the wound heal readily? Will the surgical insult to the patient's body increase the activity of the patient's disease or reactivate foci already quiescent? These and other very pertinent questions occur to the mind of the surgeon.

These questions have been put to the writer on numerous occasions by surgeons and by the friends of the patients. The impressions and prejudices left by experience lead the writer to answer as follows:

1. Tuberculous patients other than those much weakened by prolonged active disease stand general anesthesia extremely well. In the hands of a skilled anesthetist the ill effects of ether or chloroform anesthesia are not markedly greater than those seen after their use in the non-tuberculous. This opinion holds particularly for operations below the diaphragm—on the gall bladder, the appendix, the uterus and adnexa, and for operations on the genitourinary tract, including the removal of a tuberculous kidney. The author has had a limited personal experience with spinal anesthesia in tuberculous patients, but his impression is that the presence of pulmonary tuberculosis is not a contraindication against, nor a marked indication for, the use of this form of anesthesia. Personally the writer ordinarily advises gas and oxygen anesthesia where available and otherwise satisfactory, but sees no objection to ether and chloroform where these anesthetics must be used.

2. Operation wounds heal as readily as in the non-tuberculous except:

(a) Following tonsil removal where the wound frequently heals slowly and, not extremely infrequently, fails to heal.

(b) Following operation for tuberculosis complications, such as tuberculous peritonitis and enteritis, removal of a tuberculous kidney or in operations on tuberculous bones and joints.

(c) Operations for removal of anal or rectal fistula.

3. Tuberculous patients do react well following surgical insult, and it is truly remarkable how well they recover with little or no evidence of increased activity or reactivation of quiescence

* See also article in this issue, page 495, by Henry Holt, M. D., dealing with this subject.

following even major surgical operations, particularly operations below the diaphragm.

4. The author has, with the passing of the years, accumulated certain prejudices regarding surgery as it affects tuberculous persons. He is moved to record two here:

(a) Persons with active tuberculosis, or recently active tuberculosis, should not have operations performed on the pharyngeal or nasopharyngeal structures if such operations can be avoided. This prejudice applies particularly to removal of the tonsils. The prejudice is based upon the very frequent experience of seeing patients whose pulmonary activity has apparently been lighted up and very active and dangerous tuberculosis precipitated by tonsillectomy. In addition, many cases of reactivation of quiescent lesions have been seen following this operation. These accidents have been seen so frequently that the writer always advises against such operations, unless imperative, in all active tuberculous persons and in non-active tuberculous persons until an apparent arrest has been maintained over a period of two or three years.

(b) It is inadvisable to do a radical operation for the elimination and cure of an extensive rectal or anal fistula in a tuberculous person unless such operation is imperative. Such fistulas in patients who are gradually securing an arrest of their tuberculosis will eventually heal in the majority of cases with the recovery of the pulmonary lesions. Most of them are nuisances rather than dangerous complications. Unless they become acutely inflamed, as sometimes happens, they are better left alone.

CONCLUSIONS

1. A decision to operate on a tuberculous patient should depend largely upon the urgency of operation. The presence of active tuberculosis in a patient who is apparently doing well should not prevent surgical intervention where an acute surgical complication of a dangerous nature occurs; nor should it prevent surgical interference where so-called surgical or non-pulmonary tuberculosis requires the intervention of the surgeon. On the other hand, surgery which can be postponed without injury to the patient should be delayed.

2. Tuberculous patients bear general inhalation anesthesia well, and do not show a marked tendency to increased pulmonary activity following its exhibition.

3. Removal of tonsils should be avoided if possible in persons with pulmonary tuberculosis.

4. Radical operations on rectal or anal fistula are to be avoided when possible.

* * *

F. M. Pottenger, Monrovia—I hold opinions very similar to those expressed by Doctor Peers in his paper; however, I am not favorable to the use of ether as an anesthetic for tuberculous

patients. It is undoubtedly more irritating than other general anesthetics and, with its power of penetrating the cells, I think it often exerts a harmful influence upon the tuberculous process. I agree with Doctor Peers that no patient suffering from active tuberculosis should be submitted to operative procedure unless it be absolutely necessary.

Regarding tonsils, I have seen many patients lose their lives because they were unable to recover from the removal of tonsils; and the strange thing is that most of these operations were unnecessary. They were done because of a belief that the tonsil was the source of the cough; or that it contained a focus of infection which was responsible for the pains in the chest and shoulder from which the patient complained; or that this supposed tonsillar infection was the cause of the patient's lowered vitality.

I never submit a patient to a tonsil operation until his tuberculosis has become inactive, unless he has had repeated attacks of tonsillitis, showing definitely that there is a harmful focus which is likely to injure his chances of cure.

I maintain the same attitude toward operations for anal or rectal fistula. It is far better to withhold operation until the disease is arrested.

The fact that the tuberculous patient makes a good recovery from an operation in a great proportion of instances does not indicate that the operation has not done harm. The effects of such procedure are often not visible until some time after the operation has been performed. I would not withhold operation from a patient with active tuberculosis if the operation was essential for removing some condition which seriously impaired the patient's chances of recovery or threatened his life. On the other hand, I would never submit a patient suffering from active tuberculosis to an operation unless I was convinced that the condition which made the operation necessary was more serious than the tuberculosis.

* * *

Louis Boonshaft, San Jose—My opinions are somewhat similar to those of Doctor Peers and Doctor Pottenger's in reference to surgical interference on the tuberculous patient.

As to the anesthetic used I prefer gas and oxygen anesthesia. Ether anesthesia is somewhat dangerous unless given by an expert.

Nose and throat operations on patients having active disease should be avoided; particularly tonsil operations. I have seen some very disastrous results following tonsil operations on patients with active disease, and also on the so-called arrested cases. These operations should be avoided on an individual having or having had tuberculosis unless it is absolutely necessary.

As for rectal and anal fistula most of these get well as the condition of the patient improves, and

surgery is not indicated unless the condition is very extensive.

Surgery of any type on the tuberculous patient should not be done unless it is imperative.

* * *

George B. Kalb, Monrovia—Doctors Peers, Pottenger, and Boonshaft express the opinion of the majority of the profession who devote their attention to the tuberculous patient, although each of us varies slightly from the rest in his opinions, as his experiences, which aided in forming them, have varied.

With the rest, I believe that no needless operation should be undertaken in the tuberculous, whether active, quiescent, or arrested.

I have seen a quiescent lung reactivated by a pneumonia set up by ether anesthesia, and have never seen it after gas-oxygen, spinal, or local anesthesia. So I always advise against the use of ether.

When the teeth or tonsils are such that they should come out their removal is recommended if the patient's tuberculosis is not too active, but never under a general anesthetic with the exception of gas-oxygen, which may be used when it is not possible to give a local anesthetic.

Under the above rules, patients who have undergone, on my advice, these operations, as well as abdominal sections and various operations about the chest, such as fifteen extrapleural thoracoplasties, have done well.

On the whole it seems to me that tuberculous patients stand operations remarkably well, but with them, as with all others, any operation is accompanied by more or less shock and may be the deciding factor against ultimate recovery. To summarize:

1. Avoid all operations on the tuberculous, unless the danger of operation is greater than that of no operation.
2. When you must operate use local, spinal or gas-oxygen anesthesia and keep up the tuberculosis treatment during convalescence.

Treatment of Pulmonary Tuberculosis—With all that has been said and written regarding tuberculosis, it is amazing how little the average individual, interested in other affairs until tuberculosis becomes a personal matter, knows about the disease, or if he has a fair general knowledge, the difficulty of applying this to his own case becomes apparent unless there is a background based on sound instruction and a practical knowledge acquired by observation and actual practice.

Rest, clean air and proper food constitute the background or arch support of tuberculosis therapy, and rest is the keystone of the arch; without rest, physical and mental, all other known measures will fail in the majority of cases of clinical tuberculosis. The patient must be taught the principles of hygienic living, the value of fresh air, sunshine, proper food, rest and exercise, and their proper place. He must be taught to avoid excesses and excitement of every description.

He must be taught the reasons for sleeping alone in a properly ventilated room or porch and to regulate his life to the strictest routine, all of which is a difficult contract to carry out and to keep within the family budget, with the average home facilities, to say nothing of the gratuitous advice of friends or relatives who may be deceived by the patient's apparent appearance of good health. To maintain a routine as outlined demands incessant watchfulness and attention even with a cooperative and intelligent patient, and frequently requires more time than the busy practitioner can spare.

By reason of the chronicity of the disease, home treatment at the proper time makes up the larger part of the consumptive's life. It is not necessary or wise for him to spend his days in the sanatorium unless he has arrived at that stage when permanent bed treatment is required and cannot be given at home. The real value of the sanatorium in early cases is its educational program and so far as it has failed in educating its patients, so far has it failed in the treatment of tuberculosis. While it is true that any educational effort on the part of the nurse or physician makes little if any impression with some, it is certainly fair to assume that the majority of those instructed are better able to care for themselves over a long period of convalescence, and to adjust themselves to a more or less permanent handicap after returning to an industrial life, or the maintenance of a home.

Broadly, three stages of the disease are recognized: minimal, second and third stages; the classification being based on the extent of the involvement and not on the symptoms or the degree of activity. A minimal case may present more evidence of toxicity than one with a whole lung involved and as follows may present a more doubtful prognosis. It is evident therefore that the same prescription is not applicable to two cases presenting substantially the same pathology. Exercise which is a tonic for one may aggravate the symptoms of the other; therefore, before any treatment is adopted the diagnosis must go further than to say tuberculosis is present. It must determine the degree of activity and the extent of the involvement together with a "sizeup" of the patient's general, physical and mental equipment, home surroundings and financial resources. All of these questions may be determined in the home provided there are the proper facilities for observation and care. Lacking home facilities, sanatorium treatment is indicated as the first procedure rather than as a last resort; these patients should be under supervision and a rigid routine before they have become too ill for any form of treatment except terminal care. Early home treatment in the hands of a specialist with an intelligent patient and with proper facilities is undoubtedly preferable in many instances; there is no question that in the hands of a few it has yielded brilliant results. It is not the individual, however, or the isolated case that is under discussion, but the group as a whole which must be considered. . . .

The treatment or mode of life lies between two extremes: absolute bed rest with feeding by the nurse and the use of the bed-pan on the one hand, to merely observation from time to time or a camping trip in the wilderness. An early case in a young adult with fever, rapid pulse and possibly hemorrhage, requires bed rest, prolonged in many instances several months beyond the period of a normal temperature, whereas the chronic fibroid type of many years' duration may live a fairly active life, and unknown as a consumptive among his fellow-workers. . . .

We believe that absolute frankness in talking with a patient accomplishes the best results, even to the point of telling the truth regarding a cavity. His apprehensions are allayed when he learns that all tuberculous processes are followed by cavitation. They are interested in the subject and their attendance equals their attendance at moving pictures.—Ernest B. Emerson, M. D., in *The Boston Medical and Surgical Journal*.

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EDITORIALS

A NEW METHOD OF MEDICAL LICENSURE —THE BASIC SCIENCE LAWS OF WISCONSIN, CONNECTICUT, WASHINGTON, AND MINNESOTA

In 1920, Doctor O. B. Bock of Sheyboagan, Wisconsin, started an agitation in his state in favor of a new method of medical licensure. In 1921, he was instrumental in having a bill covering the essentials of the present Wisconsin basic science law for practitioners of the healing art, introduced into the Wisconsin legislature. It did not go to passage that year; and in 1923 it again met with defeat. But in 1925 the measure became a law, with only four dissenting votes in the legislature! The act went into effect on June 12, 1925.

Wisconsin's interest in such a measure arose largely from the activity of chiropractors, who in 1915 secured a law in Wisconsin, whereby they could practice unmolested, provided they did not hold themselves out before the public as licensed or registered physicians; about two hundred having entered the state every year to take up their practice.

* * *

Seventeen days after Wisconsin secured its law the state of Connecticut placed a similar act on its statute books. Wisconsin and Connecticut acted independently and without conference in securing their respective laws, and were led to their action because of quite different causes. In Connecticut a "diploma mill" scandal had arisen in connection with one of the cultist boards, and after the exposé the state had risen in its wrath,

had instituted a house cleaning and the Connecticut basic science law was the result. As a result of the investigation, in which the state medical society, the governor, a grand jury and lay citizens all lent their aid, a total of 168 licenses were revoked, about three-fourths of this number being held by persons who were practicing in other states.

In the bill it was stated that "The examination shall be so conducted as not to discriminate against the particular views of any bona fide organization, sect or school, as to any remedies or treatment or any system of therapeutics."

* * *

What is the essence of a basic science law, and why did its acceptance seem a rational method of procedure for the states which have adopted it since the first of such laws was passed in 1925?

A basic science law is founded on the proposition that a patient who consults a practitioner of the healing art may be suffering from a disease in which serious danger to health and life may be involved. The citizen who is such a patient has a right to expect that the state will protect him from incompetent advice; or at least that the state will safeguard his health and life interests by insisting that all practitioners of the healing art, no matter to what so-called school of healing belonging, should have those certain minimum qualifications in preliminary education and in professional training, that would make each such practitioner possess that fair amount of technical knowledge which should be expected and demanded of any man holding himself before the public as competent to treat injury or disease by this, that, or the other methods.

* * *

The fundamental or primary subjects having to do with the practice of the healing art are construed in most of these basic science laws, to include: anatomy, physiology, chemistry, bacteriology, pathology, diagnosis, and hygiene.

These are the subjects that are usually called the basic sciences. It is worthy of note that not one of these subjects has to do with methods of healing, but each is construed to be very proper knowledge which every practitioner who wishes to claim ability to treat injury or disease by any method whatsoever, should possess.

* * *

In these basic science acts there is no definition of the "practice of medicine" but there is a definition of the "practice of the healing art," somewhat as follows: "For the purposes of this act, any license authorizing the licentiate to offer or undertake to diagnose, treat, operate on or prescribe for any human pain, injury, disease, deformity or physical or mental condition is a license to practice the healing art."

This definition is purposely made almost all-inclusive, but the various bills exempt by special sections, such groups as dentists, midwives, nurses, optometrists, and religious healers.

* * *

It is usually stipulated that the boards of examiners shall consist of three to five members, usually laymen, sometimes professors or teachers

in liberal arts departments of colleges or universities within the state, and so on. The board is given authority to employ assistants to help carry on the examinations.

In Wisconsin the basic science board "shall consist of three lay educators, none of whom shall be on the faculty of any department teaching methods of treating the sick."

In Connecticut the first board appointed by the governor had as one of its members the professor of philosophy at Yale University, as the second an ex-judge, and as the third the chief executive of a large and prosperous manufacturing company. Dr. R. L. Rowley, secretary of the Connecticut Medical Examining Board, states that the basic science board conceived "its intended function as a board of elimination, to be a coarse sieve through which applicants for a license to practice the healing art must first pass with consequent elimination of the obviously unfit." A certificate from this basic science board is prerequisite to examination by any one of the six separate Connecticut medical, homeopathic, eclectic, osteopathic, chiropractic, or naturopathic boards.

In Washington the board of five members comes from the faculties of the University of Washington or Washington State College.

In Minnesota the board consists of professors from any university or college in Minnesota.

* * *

Provisions are made in these acts as regards: Organization of the boards, fees to be paid by applicants, examinations and the passing standards required, requirements for a certificate, reciprocity, appeal to the courts from the board's decision, illegal certificates, fees paid unauthorized practitioners recoverable, enforcement, exceptions, saving clause, and so on.

On the subject of the requirements which must be met by anyone who would take a basic science examination, the following could be quoted: "No certificate shall be issued by the state board of examiners in the basic sciences unless the person applying for certificate submits evidence satisfactory to the board: (1) that he is not less than twenty-one years of age; (2) that he is a person of good moral character; (3) that he was graduated by an accredited high school or school of similar grade, or possessed educational qualifications equivalent to those required for graduation by such an accredited high school before he began the study of the healing arts, and (4) that he has a comprehensive knowledge of the basic sciences as shown by passing the examination given by the board, as by this act required.

"Comment: No evidence is required of the applicant of the extent and nature of his knowledge of the basic sciences. These are to be determined by the board of examination. The professional licensing board to which the applicant must subsequently apply for his license to practice is to be at liberty, it is proposed, to accept the findings of the state board of examiners in the basic sciences with respect to the proficiency of the applicant in those sciences, or to re-

examine the applicant in those sciences on its own account."

* * *

From the foregoing it is seen that the medical, osteopathic, chiropractic and other examining boards existing in a state are not wiped out of existence but are permitted to carry on in line with the preceding paragraph.

In similar manner, no practitioner of the healing art licensed in a state at the time of the enactment of a basic science law is deprived of any of his previous rights to practice.

* * *

A very interesting section is that which proposes to deal with a new type of penalty for the unauthorized practitioners. It reads: "Any money paid out by any person as compensation for services rendered in the practice of the healing art or any branch thereof to any person not validly licensed to practice such healing art or branch, when the payor did not know that such person was not validly licensed so to practice, may be recovered by the person who had paid such money by a suit instituted within two years from the date when such fee or compensation was paid.

"Comment: One who practices the healing art or any branch thereof unlawfully cannot now obtain the aid of the courts in collecting money for his unlawful act. This section proposes merely to permit one who has innocently paid money for such unlawful services to recover it by suit."

* * *

From what has been here written, it is noted that these basic science laws in these different states show quite a different method of approach to the whole subject of licensure of practitioners of the healing art than has been the vogue in the past. These basic science laws are startling in this pronounced variation from established methods, and startling also in their simplicity and logic.

That four states in two years should have passed such laws, and that other states have such proposed laws under consideration, should make the whole subject of interest to all physicians who desire to keep in touch with legislative matters having to do with the healing profession.

PULMOTORS AND LUNG MOTORS SHOULD BE DISCARDED—OXYGEN-CARBON DIOXIDE TREATMENT MORE EFFICIENT

The sixth annual convention of the National Association of Police and Fire Surgeons and Medical Directors of Civil Service Commissions of the United States was held in Los Angeles, September 8, 9, and 10. A discussion in which great interest was taken was led by Drs. Daniel J. Donovan and Harry M. Archer, respective heads of the police and fire departments of New York City. The discussion dealt with resuscitation methods. These surgeons unhesitatingly condemned devices such as the pulmotor and lung-motor as being mechanical aids that could not be depended upon to consistently deliver air or gas mixtures to unconscious moribund persons; and made the point, in their opinion, that apparatus

of such type had been actually the major responsible cause of death in many instances.

These statements should be of very great interest because in recent years positive pressure apparatus such as the lungmotor and pulmotor have received such great newspaper publicity that emergency police or fire surgeons who do not resort to the use of such are apt to come in for severe criticism from both the press and the laity. One of our California police surgeons, who believed this type of apparatus quite dangerous, told of a recent experience in which the newspapers of his city had criticized him sharply for not using such apparatus.

It is encouraging to know that the oxygen-carbon dioxide treatment of carbon monoxide poisoning has the endorsement of a commission that made an investigation of this subject, and which has on its roll the names of such men as Cannon, Drinker, Henderson and Edsall of Harvard, Haggard of Yale, and Sayers of the U. S. Bureau of Mines.

That commission recommended the discontinuance of apparatus of lungmotor and pulmotor type, urged the encouragement of the use of the prone pressure method of artificial respiration, and suggested that special apparatus of certain standard types be used to secure an inhalation of 95 per cent of oxygen and 5 per cent of carbon dioxide. The three types mentioned as being up to proper standard were the H.-H. Inhalator, the Industro-Oxygenator Universal Model, and the Atmos Inhalator.

This comparatively new treatment which was devised by Doctor Henderson and Doctor Haggard of Yale University depends upon their recognition of the fact "that for every physiological reason, the immediate necessity in gas poisoning is a free flow of oxygen into the pulmonary alveoli, and the mixed oxygen with 5 per cent of carbon dioxide, thus utilizing the stimulating effect of carbon dioxide on breathing in order to get a high concentration of oxygen in the lungs."

The method referred to is being used by many organizations throughout the United States and should be given serious consideration by all establishments or communities which still adhere to the positive pressure ventilation apparatus, such as the pulmotor or lungmotor.

In another interesting discussion, Doctor Donovan, chief surgeon of the New York City police department, stated that his staff had blood typed more than 1000 policemen, and that a policeman of proper blood type, by motorcycle or auto, could be brought within thirty minutes to any hospital where a blood transfusion was needed for a policeman or a member of his family. In this manner a group of men with the best standard of blood content and of proper type, was displacing the professional blood donors whose employment on pay, spelled danger through test delay and low grade blood, even though of type. Such men, whose blood types were of record, could, if they desired, volunteer their blood to help save life in civil practice.

A third topic was the presentation of photographs of a beautiful convalescent and recreation home on the Hudson for members of the police department and their families. The fireproof building and the cottages and pavilions were erected with funds from the members of the department. The thought is of suggestive value to those who believe that state medical associations could advantageously consider such an activity for the members of their own guilds.

SHOULD INJURED COUNTY EMPLOYEES RECEIVE GRATUITOUS PROFESSIONAL SERVICES FROM NON-SALARIED ATTENDING COUNTY HOSPITAL STAFF MEN?

The "Workmen's Compensation Insurance and Safety Act" of California provides that almost all workmen and workwomen who are injured in connection with their employment shall receive proper medical and surgical care, as well as compensation for physical inability to return to work, such compensation commencing the eighth day after the injury complained of.

Section 9 of the act stipulates that "where liability for compensation under this act exists, such compensation shall be furnished or paid by the employer and be as provided in the following schedule."

The language of the act specifically states "the employer" shall pay. Employer may mean a private citizen, a form of company or corporation, a city, a county, the state.

* * *

If private citizens who are employers are stringently held to the letter of the law and are made to pay for medical and surgical services on the fee table basis established by the California Industrial Accident Commission, it would seem only fair and proper that cities and counties should be made to live up to the same rule, for these community entities are in no manner exempted from the provisions of the Workmen's Compensation, Insurance and Safety Act.

* * *

If the supervisors of a county which maintains a county hospital wish to rule that the superintendent of the institution, in case he is a licensed practitioner, or the paid resident or paid attending staff members, shall give medical and surgical care to injured county employees coming under the purview of the industrial injury act, that would appear to be within their rights, if the stipulation of those additional duties was included in the understanding which the supervisors had with these salaried physicians.

However, when a county, and especially a wealthy county, expects or demands of the members of an attending staff, who offer to give their services without pay to the county poor who are in such a county hospital, that such attending staff members shall give medical and surgical services to injured county employees without that pay which the industrial accident act states that every physician who gives professional service to an injured employee has a right to demand, then such a county is taking an unfair advantage of such hospital staff members of our profession.

There is a principle involved in this that has to do with honest and fair dealing, as stipulated by the laws of California, and that principle far transcends the amounts of money which would be received as fees in the cases noted. We have heard the subject discussed by many medical men who are familiar with the conditions just pointed out, and have yet to hear sound reasons why a city or county should not pay the fees authorized by the Industrial Accident Commission. It is to be hoped that the heads of county hospitals will not be backward in calling the attention of boards of supervisors to the legal and ethical injustices which come into operation when non-salaried attending staff men are called upon to give such gratuitous services. The non-pay procedure mentioned, wherever in vogue in California, should be discontinued. It is not in accordance with the law, and is an imposition on generous members of the medical profession.

THE BOARDS OF HEALTH AND MEDICAL EXAMINERS—THEIR RELATION IN THE NEW EXECUTIVE DEPARTMENTS OF THE STATE OF CALIFORNIA

Citizens who kept in touch with the newspaper accounts of the proceedings of the biennial session of the California Legislature which took place in the first four months of this year were aware that marked changes in the executive organizations of the state were provided by laws then enacted; with still further changes in view when the 1929 legislature convenes.

Only so recently as January 1, 1919, California had the high total of 112 independent agencies, responsible only to the Governor, to give expression to the executive branch of our State Government. In a chart brought out by the California State Printing Office, the two of the 112 blocks thereon indicated, in which the medical profession had a special or personal interest were those marked for the Board of Health and the Board of Medical Examiners.

Between January 1, 1919, and July 29, 1927, a change was brought about in the executive divisions of our commonwealth. The system of 112 independent agencies was changed so that five newly instituted departments—education, institutions, finance, public works, and agriculture—absorbed or brought under the supervision of those departments, about fifty-eight of the independent agencies already referred to, leaving only fifty-four independent agencies directly responsible to the Governor.

On July 29, 1927, Governor Young's plan of a cabinet known as the Governor's Council, and consisting of the heads of nine departments, came into being. This was brought about through legislation passed by the California Legislature of the current year. In that plan the nine departments—institutions, industrial relations, natural resources, education, finance, public works, agriculture, public health, and social welfare—absorbed of the 112 independent state agencies

responsible only to the Governor, all but thirty-eight, one of these thirty-eight being our present Board of Medical Examiners, which still functions as in previous years; while one of the newly-created departments was that of public health.

On one of the charts depicting these changes the Department of Public Health is listed with one block showing the State Board of Health and four empty blocks attached thereto, the contents of which are still to be determined.

At the present time, the activities of the California Department of Public Health include the following fourteen divisions: child hygiene, nurses registration, bureau of tuberculosis, sanitary engineering, sanitary inspection, cannery inspection, pure food and drug laboratory, hygienic laboratory, crippled children, vital statistics, epidemiology, public health nursing, prevention of malaria, and social hygiene.

The fourteen divisions just enumerated at a future date will be joined into probably three or four groups, with group names still to be determined.

The head of the new Public Health Department, known as the Director of Public Health, is appointed by the Governor and holds office at the Governor's pleasure. Governor Young has appointed as director of the department, Walter M. Dickie, M. D., late secretary of the Board of Health, a choice that meets with the generous commendation of the medical profession, so far as we know. As director, Doctor Dickie is a member of the Governor's cabinet or council and is the executive officer of the department and of the Board of Health.

Interesting as are the foregoing changes, the end, however, is not yet. For in 1929, when the next legislature convenes, it is proposed to carry on the regrouping, or consolidations, so that in place of the 112 California agencies of 1919 there shall be retained but eleven of the independent agencies, responsible only to the Governor, the remainder being absorbed by eleven instead of the nine departments of present date—a professional standards department (which would include the present sixteen different examining boards, the Medical Board among others) and a commerce department, being the two new department additions.

These changes in methods of executive organization in California are almost radical, but on study seem to present many advantages and should enable the agencies which existed independently in the days gone by to do more efficient work than ever before. These eleven department heads or directors who form the Governor's Council should also be in position to aid him greatly in the important and very responsible duties which come to the executive head of so vast and wealthy a domain as the state of California.

Because the Public Health Department and the Board of Medical Examiners are executive departments and agencies in which organized medi-

cine is vitally interested it seemed desirable that the editors should give to members of the California Medical Association this brief survey of the present and prospective relationships of those boards.

THE LURE OF MEDICAL HISTORY

The publication in a recent number of *Science* of an address by Prof. E. B. Krumbhaar before the Pierson Anatomical Society of the University of Pennsylvania brings home to us here in California the opportunities that lie before us and of which as yet we are making little use. Or to put it in a more tempting manner, it reminds us of the advantages for relaxation and enjoyment which we are overlooking.

Professor Krumbhaar's address is a plea for the recognition that the perusal of medical history may be justified by arguments both of a practical and of what for want of a better term we may call a cultural nature. As he says:

"With the inroads now being made on legitimate medicine by osteopathy, chiropraxis and the various isms, any one of us should be interested in learning about the quackery and superstitions of previous ages—yes, and having learned about them, be better able to cope with what later might become a very practical matter directly affecting the fatness of our own pocketbooks."

And in not so pragmatic a strain, but still on earth enough for the most practical of us, he quotes Osler:

"By the historical method alone can many problems in medicine be approached profitably. For example, the student who dates his knowledge of tuberculosis from Koch may have a very correct, but a very incomplete appreciation of the subject."

Personal pride in the cultural tone of our profession should also lead us to avoid the reproach that he suggests when he warns us that the name Pasteur should mean more to us than the prefix of a method of sterilization or that of Liebig more than an "ad for meat extract."

How then are we to begin, or perhaps renew, our acquaintance with the subject of medical history? Professor Krumbhaar suggests that we follow Emerson's advice and "take hold anywhere." Garrison's list of curiosities is available to tempt the most jaded interest.

"The gold-headed cane, Saint Anthony's fire, the red and white stripes on the barber's pole, the duels of physicians, the blood suckers who attended duelists in the eighteenth century in order to suck their wounds, the wound drinks of the Middle Ages, the purgative inks of the Arabians, the anodyn necklaces, quassia and antimony cups of the past as compared with the medicated milks, iodated foods and diuretic wines of the moderns, cupping and leeching, the seton and the moxa, the sympathetic powder for healing wounds at a distance, the use of the bare foot as a thermometer in the Middle Ages, the introduction of Dover's powder by a buccaneer, the statues erected to the memory of great physicians and the streets named after them, the quacks of the eighteenth century, the medical graduation ceremony, the use of bo-

tanical gardens to teach materia medica, hex-doctoring in Pennsylvania, the medical superstitions and folk-ways of different races—any one of these subjects, taken at random as a starting point and closely studied, will throw you into the full current of medical history."

The desire soon will come to fuse these isolated fragments into a more comprehensive survey of the development of medical knowledge, and for this are available such readable and reasonably brief outlines as Osler's "Evolution of Modern Medicine" or Garrison's "History of Medicine."

As has been said before, these remarks of Professor Krumbhaar should be of especial interest to us, for San Francisco possesses one of the finest historical collections in this country. The historical section of the Lane Medical Library offers not merely books about medical history, but the very books that constitute in themselves the progressive steps in medical history. A first-hand contact is possible to us that is denied to most who wish to interest themselves in the subject. Not many of us perhaps can hope to explore deeply into "*De humani corporis fabrica*," but the beauty of its woodcuts is enough to hold one fascinated before the still fresh crispness of its magnificently printed pages. In this humble way at least we may associate with the great men of the past in the only part of their personality that persists today, their contemporary printed thought.

The scope of the historical section of the Lane Medical Library has been described in an earlier number of this journal.¹ Its examples cover the entire period of western medicine from the beginning of printing to the historical studies of the present day. Oriental medicine, especially Arabian, is represented by numerous manuscripts. Moreover the physical surroundings that are so necessary to the use and enjoyment of a collection of books are found in its large special reading room and stacks which occupy the entire fourth floor of the library building.

The historical volumes of Lane Library can be read by all members of the California Medical Association or visiting physicians. Those who desire to remove these volumes from the library must either be associated with Stanford University or be subscribing members.

Professor Krumbhaar's address has suggested that attention should be called to these opportunities which lie before us, and it is proposed that in CALIFORNIA AND WESTERN MEDICINE, each month a short summary will appear describing some noteworthy name in medical history with a brief description of those of his works which are available at Lane Library. No attempt at biographical or descriptive details is contemplated, no preconceived plan will be followed. As Emerson suggests, we shall take hold anywhere, tell you very little, except what your opportunity is, and hope that your visit to the library will accomplish our purpose. And this is that your enjoyment of medical history may be founded not on books about books, but on the stones themselves of which the edifice of modern medicine is built.

1. California and Western Medicine, 1925, xxiii, 576.

MEDICINE TODAY

Current comment on medical progress, discussion of selected topics from recent books or periodic literature, by contributing members.

Endocrinology

Diabetes and Acromegaly—The conception of the interrelationship of the endocrine organs has been convincingly developed by Eppinger, Falta, Rudinger, Cushing, and many others, although the precise relationships are as yet but poorly understood. As an illustration of the frequent dependency of one hormonopoietic structure on the proper function of another, the presence of a persistent hyperglycemia and glycosuria in patients suffering from acromegaly may be cited. It is usually and probably correctly assumed that a hyperglycemia, if constant, results *per se* from an insufficient supply of insulin, and this in turn necessitates the hypothesis of a diminished activity of the islet tissue of the pancreas. Such a condition, in the great majority of cases, results directly from pathological conditions existing in the pancreas itself. There are occasions, however, when the metabolism of carbohydrates varies from the normal, not because of primary pancreatic insufficiency, but secondarily as a result of disease of other endocrine structures as, for example, the pituitary body.

Cushing observed several years ago that a nearly total pancreatectomy appeared to activate posterior lobe secretion and that animals with a pituitary deficiency seemed to tolerate the loss of the major portion of the pancreas better than normal animals would have done. Furthermore he learned that manipulation of the hypophysis sometimes caused a transient hyperglycemia with glycosuria. He investigated the sugar tolerance of partially hypophysectomized animals and found that the temporary lowered assimilation limit for carbohydrates ultimately became raised. This increased tolerance for the ingestion of sugar could be overcome by coincidental administration of either posterior lobe extract or of thyroid extract. He therefore ascribed these symptoms of pituitary deficiency to an impaired oxidizing or metabolizing capacity of the body from the loss of posterior lobe extract with a resultant transformation and storage of sugar as fat.

On the other hand, it is now well known that a symptom complex not distinguishable from diabetes mellitus accompanies acromegaly in about 40 per cent of the cases. Colwell¹ has in a comprehensive manner recently reviewed the literature on this subject in an attempt to correlate the facts concerning the rôle of the hypophysis in carbohydrate metabolism. His investigations brought forth the fact that, contrary to the usual idea, there is no reason to believe that a distinct hypophyseal diabetes occurs, which is different from pancreatic diabetes, although the "diabetes

of acromegaly differs from the ordinary diabetes without hypophyseal disease in that it is capable of undergoing spontaneous temporary or permanent recovery." However, while it exists, the diabetes mellitus which so frequently accompanies acromegaly resembles ordinary diabetes mellitus in all respects. Following Cushing's idea that a condition of hypopituitarism brings about an impairment of the oxidizing capacity of the body, the hyperglycemia which may be induced by overactivity of the hypophysis "is ordinarily thought to be due to an excessive rate of glycogenolysis which temporarily supplies glucose at a rate which exceeds the normal ability of the organism to dispose of it. The resulting hyperglycemia and glycosuria exist as long as the stimulus to increased glycogenolysis endures." Thus such a condition would result from an essentially different mechanism than the one producing the hyperglycemia in diabetes mellitus, although the hyperglycemia in both are due to a glucose supply rate exceeding the glucose utilization rate. As Colwell points out, however, it is possible that these two identical conditions may be of similar origin and that the hyperglycemia of acromegaly may result from a temporary functional impairment of the insulin-producing tissue.

As is also suggested by Colwell, "the hypophysis may be without significance in the field of carbohydrate metabolism as a gland of internal secretion," but that important nerve centers or pathways situated near it and which are concerned in the control of insulin secretion are so affected by conditions existing in the pituitary body as to bring about unusual conditions in carbohydrate metabolism. This, however, is difficult to reconcile, not only with the increased glucose tolerance produced by the functionally deficient hypophysis—which being certainly no larger than normal can produce no untoward stimulation on adjacent nerve paths—but also with the various pituitary diseases associated with diabetes, in which the pituitary body has been found to be diminished in size. It is unfortunate that no studies of glucose metabolism were made by Smith² in his recent article on the disabilities caused by hypophysectomy in the rat. He showed that the syndrome usually ascribed to an insufficient pituitary secretion characterized by adiposity and genital undergrowth is in reality (as suggested by Camus and Roussy, Aschner, and others) the result of injury to the hypothalamic region. Had it been possible for him to show an increased glucose tolerance in his rats, definite experimental evidence as to the effect of the stimulation of structures adjacent to the hypophysis on carbohydrate metabolism would have been produced. Until work of this

1. Colwell, A. R.: *Medicine*, 1927, 6, pp. 1-40.

2. Smith, P. E.: *J. A. M. A.*, 1927, 88, pp. 158-60.

character is carried out, showing definitely the effect of stimulation of the structures adjacent to the pituitary body on glucose metabolism, the pertinent fact that a diabetic syndrome indistinguishable from true diabetes mellitus accompanies a hyperactivity of the hypophysis (acromegaly) in about 40 per cent of the cases should be ascribed to the interrelationship of the hypophysis and the pancreas.

H. CLARE SHEPARDSON,
San Francisco.

Proctology

Hemorrhoids—The injection treatment of hemorrhoids had a rather shady beginning, and it seems never to have been able to attain to the first rank of repute. One is tempted to be a trifle apologetic on introducing the subject.

It is not easy correctly to ascertain results of any therapeutic procedure until a great mass of experience has been accumulated. In the few decades of its use the injection method has been thoroughly tried out here and there by reliable men, and their testimony can be had. Boas¹ writes of ten years' experience with it, and in a conservative manner expresses his satisfaction.

A special point that he brings out is that the injection method is to be regarded as just as radical a method as any form of surgical treatment. There is no more, and no less, tendency for recurrence. Men with the widest experience probably best realize that, the Whitehead operation excluded, no treatment for hemorrhoids can be considered as truly radical and a guarantee against recurrence. By the injection method all hemorrhoids present can be completely obliterated. Excision, clamp and cautery, or ligation accomplish nothing more.

However, the indication, contraindications and technique are of vital importance. Unless one has full knowledge of these matters the surgeon is possibly less justified in using the injection method than in operating. But properly applied, the injection treatment seems to give good results and will probably increase in popularity.

GORDON F. HELSLEY,
San Francisco.

Cancer

Encouragements in the Treatment of Cancer—"There is no cure in sight for malignant disease and there is little likelihood of one until after the cause is settled. Before any headway was made in the control of most diseases that are under control, the cause has first been settled and not until then did rational attack begin."

Now and then, and sometimes in supposedly responsible quarters, unfortunate statements are made about various phases of cancer. The above quotation is one of these, mainly because it is untrue. Cancer can be likened to an Easter chick, easily done for, if roughly handled in its early development. The malignant and deadly attributes of cancer are easily comparable to the

methods of the rattlesnake. He will kill unless the trick is done to him first, and it usually requires a man to do it. Pussyfooting with either a cancer or a rattlesnake accomplishes only one thing—it makes them more effectively destructive. But there is nothing more submissive or yielding, as far as treatment is concerned, than cancer if it is utterly destroyed early.

Does the physician from whose article I have quoted at the head of this page mean to imply that no case of cancer ever recovers when treated by the recognized methods known today? Perish the thought, for it, too, is untrue. Many physicians, and through them also the public, seem purposely to have developed a psychological twist that, I fear, has grown out of the prevailing fashionable pessimism, when they think or hear or tell of the possibility of even trying to treat cancer successfully. Two of the greatest scourges of the race (syphilis and malaria) were cured long before laboratory workers brought their training and scientific imagination into play and superbly revealed their cause.

Cancer seems the great problem that it is today mainly because it has almost been left alone in its evil mischief. So many of the hydra-headed monsters that have been responsible for the ills of mankind have been beaten back from the front line where they had heretofore destroyed comfort and invited death, that the subject of cancer seems and looks much larger by way of contrast than it formerly did. Many of these diseases had been successfully treated for centuries before their causes were known, and when these were finally discovered it was usually found unnecessary to depart from the treatment that had grown with the race to combat it. It is also interesting to remember that the death rate which obtained in these then uncontrolled diseases killed more of their victims than so far has ever been true in the mortality from cancer.

The available means for the successful management of cancer will prevent its ever becoming the menace that present-day treatment pessimists are prone to insist that it will. In very early cancer, especially of the skin and above the collar bone, practically all will recover following thorough operation with the hot or cold knife, radium, and the x-ray. In the moderately advanced cases of accessible cancer in other parts of the body 50 per cent will recover, and in the advanced patients who are usually assumed to be in the terminal or hopeless stages of the disease, if they have good hearts and kidneys, fully 20 per cent, under present known methods of management, will live after treatment, normal lives over the five-year period.

Many members of the medical profession seem ready to change or at least modify their formerly hopeless attitude regarding the possibility of successfully doing anything to alter our present depressing mortality statistics in cancer. This had to come because the present situation is not only irrational and absurd, but it is also indefensible.

Our treatment of cancer must have as its basis the prevention of the further development of the disease in a given patient. This is certainly more

1. Boas: Deutsche Med. Wochens., 1927, No. 13.

rational and what we all hope will finally be the modern vision of the need of the hour in our attitude toward the management of the cancer patient. Such a view will aid the medical profession, and through it the public, to scrape off some of the scientific mold that at present envelops the whole subject of investigation and treatment. In addition, and of paramount importance, it emphasizes that we neglect to study and familiarize ourselves with and to utilize what we now have and know to be of proven value for both the cure and palliation of this only apparently increasing menace to the race.

JAMES F. PERCY,
Los Angeles.

Neuropsychiatry

Extramural Psychiatry—Formerly, physicians specializing in mental diseases led mainly somewhat monkish existences in asylums for the insane, largely out of touch with the general medical profession.

Among the profound changes which have affected medicine, psychiatry has gained justified recognition as a legitimate and necessary branch of both institution and private practice.

Only a small proportion of people suffering from mental abnormalities which distress them and impair or destroy their usefulness, are committed to state hospitals, or need to be.

Nevertheless since the restless and ever changing life of our times is continually imposing heavier burdens, we find an increasing number of individuals mentally inadequate to adapt themselves to its requirements.

The experiences of the great war, the intensive study of child development and the causes of delinquency and crime and the pandemic distribution of infectious diseases of the nervous system, not rarely leaving behind aberrations of the psyche, have taught us the need of attacking the problem at its source.

More practical familiarity with the phenomena of mind than heretofore attained is desirable for the general practitioner, upon whom falls the responsibility of first detecting—or at least suspecting—the abnormal, both in body and in mind.

It should be possible for him to gain a certain psychiatric background, for which he will find use, among the functionally nervous, drug-taking, defective, constitutionally inferior and half-insane people with whom he comes into contact as well as in better understanding cerebral symptoms in somatic disease.

Should all physicians acquire the habit of noting the mental make-up and peculiarities of their patients, as well as points in the family history bearing on such cases, our psychiatric knowledge and our ability to deal with many social problems would be much advanced.

In densely populated regions skilled psychiatric advice is generally available but throughout great areas the family physician is the sole reliance until commitment to an institution is secured. If in the

presence of a psychosis he acts with sense and prudence he can well meet any emergency.

While it is axiomatic that the really insane can best be handled in institutions, there is nearly always a period when the diagnosis is in doubt; also arrangements for transfer occupy time.

Though nothing can replace actual experience, all physicians should take to heart the following facts:

Insanity is a relative rather than an actual conception and is determined upon social rather than scientific grounds, that is upon the ability of the individual to sustain himself and to live in the community without being a danger or a nuisance.

Mental diseases run a course, not of days or weeks, but of months and years, and provision for the care of mental patients should be made accordingly.

Prognosis as to recovery depends entirely upon the nature of the disease.

Delirious and confusional states arising from intoxication, infection and exhaustion as well as symptomatic psychoses have a prognosis favorable in proportion to the removability or curability of the underlying cause.

Manic-depressive attacks tend to recover, but are likely to recur later.

Dementia precox tends to progressive mental enfeeblement, but there may be remissions for a long time during which the patient may appear to have recovered.

General paresis and the organic psychoses are of altogether unfavorable prognosis, though here also remissions for long periods may occur.

Epileptic psychoses are progressive and of poor outlook.

All acute mental cases need watching day and night. In depressed patients the danger of suicide is ever at hand and never to be disregarded.

There is no greater error than the idea that the mentally disturbed need constant diversion, change of scene, etc.

Nothing is of more value in reducing excitement than rest in bed away from visitors and all irritating influences, combined with judicious hydrotherapy. The tepid pack is always available and the family bath tub can give a fair substitute for the continuous bath of the hospital.

Of drugs, bromides, while mainly too weak, have some value in adequate doses long continued. Chloral, trional, veronal, medinal, luminal, allonal, etc., act well in many cases, but hypnotics should be used as little as possible. Hyoscin is a two-edged sword of great value in manic excitement in the robust, but depressant and sometimes delirifacient. It usually acts best combined with morphin. It is absolutely contraindicated in alcoholics, in whom it may cause sudden death.

The most efficient ally is an experienced nurse. A good asylum "attendant" is of infinitely greater value than the best trained nurse without psychiatric experience.

Women nurses have usually a soothing effect upon

male patients, prejudice against their use in ordinary cases having about disappeared.

However, some men are too erotic, violent or dangerous to be handled by women.

The really insane person should generally be removed as soon as possible to an institution, since home care is seldom a success. This, however, does not necessarily apply to senile demented, many of whom can be managed with safety at home.

CHARLES LEWIS ALLEN,
Los Angeles.

Syphilology

The Origin of Syphilis Is Still Much Debated—The recognition of the relation of skin manifestations to the primary lesion happened to occur at about the time of the discovery of America by Columbus. The various European countries for a while were content to name the disease after each other, but soon they collectively transferred the blame to the Americas, and so inaugurated a debate that has occasionally become most bitter.

We will consider some of the data supporting the pre-Columbian origin of syphilis. Thousands of leprosariums in existence for centuries in Europe were closed when "lepra" was seen to be syphilis early in 1500. The "lepra" of the Middle Ages had a degree of contagion unknown to leprosy of our day. That "lepra" followed intercourse with an infected woman may be seen from "*lepra ex coitu cum foeda muliere*," Bernard de Gordon, about 1290 A. D. or, "*Ille qui concubuit cum muliere, cum qua coivit leprosus, puncturas inter carnem et corium sentit, et aliquando calefactiones in toto corpore, et postea frigus et insomnietates, et circa faciem quasi formicus currentes*," J. de Gaddeson, "*Rosa Anglica*," compiled 1314. A letter from Pierre Martyr written in 1488 to his friend Arias, "You write me that you are affected with a . . . disease, called . . . Galico by the Italians. . . . You describe with incomparable elegance . . . the uneasiness in your joints, . . . and lastly, the ulcers in the mouth and foetor of your breath."

Karl Sudhoff has carefully compiled references to syphilis before 1494 and the period shortly afterward. He quotes many prescriptions in use in the Middle Ages for "lepra" the principal ingredient of which is mercury.

Many verses of the Bible have been questioned by some as references to syphilis, such as David's lamentations regarding his diseased bones, nocturnal pains, etc., following his affair with Bath-Sheba, or the scourge of Baal-Peor, but the verses citing the relation of alopecia to connection with prostitutes cannot be ignored (Isaiah iii, 17 and 24).

Among the Romans one may mention the love poems of Martial which speak of condylomata and their relation to intercourse.

Most interesting is a translation into French of some ancient Chinese manuscripts by Captain P. Dabry, French consul at Hong Keou, in 1863. Dabry, a scholar of Chinese literature, was not a physician, nor had he any axe to grind regarding

the origin of syphilis. The manuscripts translated were those collated on medicine by the Emperor Hoang-ty, 2637 B. C. The chancre, genital and extragenital, is described in exact detail. The Chinese word for copper is used to describe the color of skin manifestations. Tertiary lesions and hereditary syphilis were described with surprising completeness, and most interesting of all was the treatment—rubbing with mercury and oil.

MERRILL W. HOLLINGSWORTH,
Santa Ana.

The Kahn Precipitation Test—The time-honored Wassermann test may soon be supplanted by a much simpler laboratory test for syphilis, the Kahn precipitation test. This test depends upon the production of a visible precipitate when the Kahn antigen is mixed with a serum containing syphilitic reagin. Although this test is comparatively new its accuracy has been so proved by comparison with the Wassermann test in many thousands of cases that it has been officially adopted by many private, state and government laboratories.

In a recent article comparing the Kahn and Wassermann tests as performed on 26,000 sera, Thomas G. Hull of the Illinois Department of Public Health speaks very highly of the Kahn test. He reports a close agreement of the two tests in 97.8 per cent of the cases. In cases in which the tests differed the Kahn test was found to be more sensitive in those cases which had received treatment. It gives no more false positive or false negative results than does the Wassermann test.

The Kahn test requires very little equipment—antigen, test tubes, water bath, pipettes, saline and patient's serum. It does not require the sheep, rabbits and guinea pigs demanded by the Wassermann test. This makes for economy. Having but one reagent which requires standardization, the Kahn test is less subject to errors in technique than the Wassermann. For the same reason its performance is far less laborious.

It requires less than an hour to run a Kahn test, whereas the modern Kolmer-Wassermann test requires eighteen to twenty-four hours.

The Kahn test can be performed on specimens of blood which are hemolyzed or anticomplementary and so unsuited for the Wassermann test.

With all of the above advantages, including simplicity, the Kahn test is not one which can be run in daily office work by one untrained in its interpretation.

H. J. TEMPLETON,
Oakland.

Correction of Error in July Issue—The x-ray plates illustrating Dr. Henry J. Gerstenberger's article on "The Antirachitic Value of Human Milk" which appeared on page 42 of the July issue of CALIFORNIA AND WESTERN MEDICINE were reversed in printing. In consequence, the legends 1-a should read 1-f; 1-b, 1-e; 1-c, 1-d; 1-d, 1-c; 1-e, 1-b; and 1-f, 1-a. Doctor Gerstenberger's address should have been, The Babies' and Children's Hospital, 2103 Adelbert Road, Cleveland, Ohio.

STATE MEDICAL ASSOCIATIONS

CALIFORNIA MEDICAL ASSOCIATION

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OFFICIAL NOTICES

Extension Lecture Service—In the September issue of CALIFORNIA AND WESTERN MEDICINE was published a notice to members inviting them to join the Extension Lecture Service and to submit not more than four papers they were prepared to present before county societies. That this service is appreciated by county societies is evidenced by the report in this issue from the Marin County secretary; and that it is constantly used is shown by the monthly reports of all county secretaries.

The completed program, listed by authors and by departments of medicine, will be furnished all county secretaries as a reprint on November 1. Further names and titles will be included if sent this office prior to October 15.

Appended to the county society news will be found the complete Extension Lecture Program.

COMPONENT COUNTY SOCIETIES

ALAMEDA COUNTY

The regular meeting of the Alameda County Medical Association was held at the Ethel Moore Memorial Building, August 15, 1927, being called to order at 8:15 by President George Rothganger. The program of the evening, which was prepared by Dr. Harry E. Foster, consisted of a symposium on Scarlet Fever and Scarlet Fever-Like Diseases. Dr. Frank M. Kelly, recently appointed health officer of the city of Oakland, discussed the subject, Scarlet Fever and Scarlatinaform Eruptions. He reviewed the classical symptoms and differential diagnosis of these diseases, laying emphasis upon the fact that differentiation is not always possible even by those of wide experience. Dr. J. R. Scott, health officer of the city of Berkeley, discussed the Epidemiology of Scarlet Fever; Dr. H. C. Coe took as his subject, Scarlatinaform Eruptions, reviewing briefly many of the diseases which may be confused with scarlet fever. Dr. W. A. Wood talked upon the subject, Modern Methods of Treatments of Scarlet Fever, emphasizing the importance of general methods and laying stress on the fact that specific therapeutic measures were not yet sufficiently developed to be relied upon, but that they were of assistance in the graver forms of the malady. There being no other business the meeting adjourned to the refreshment room for a social hour.

GERTRUDE MOORE, *Secretary.*

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FRESNO COUNTY

The September meeting of the Fresno County Medical Society was held at the Hotel Californian, Fresno, Tuesday evening, September 6. Neil Jorgensen presided in the absence of D. I. Aller, president of the society. The minutes of the June meeting were approved as read. There were no committee reports.

An advisory committee of four members of the

society was granted to G. L. Long, county health officer, at his own request.

A resolution was adopted by the society expressing sympathy to the family of W. P. Miller, who died during the summer recess.

F. R. Ruff, roentgenologist to the Burnett Sanitarium, was elected to membership in the society.

The paper of the evening was presented in a most interesting manner by L. A. Emge of Stanford University. "The Cause and Treatment of Sterility in Women" was his subject.

According to Doctor Emge there are between three and four million sterile marriages in our country within the child-bearing age. We have no justification in applying any procedure to relieve this sterility before we have decided wherein lies the barrier to fertilization. Sterility is a fifty-fifty proposition, and yet, in one series of 108 cases Doctor Emge had charted, forty-eight women had been operated upon with but little personal investigation, and none of the husbands had been examined. The histories revealed a curettage or suspension as the usual operation, although Doctor Emge believes a suspension would rarely ever influence pregnancy. Curettage is seldom indicated except in hyperplasia of the endometrium.

Examination shortly after coitus best adjudges capability of both husband and wife. The sperm is thus in its natural environment as to temperature and chemical reaction. Tubal insufflation was next mentioned as an aid in determining the potency of the fallopian tubes. The technique used by Doctor Emge was given in detail—its indications and contraindications. Doctor Emge called attention to the recent fatalities from insufflation recently reported by Moench of New York and other cases in Chicago. The use of iodized oil in filming the tubes was evaluated and x-ray films showing different conditions of tubes passed out to the audience. Here again the contraindications to this method were brought out—iodized oil is never to be used in palpable or visible pathology of uterus or tubes.

Cervical obstruction and infantilism were given as the two commonest causes of female sterility, and by cervical obstruction was meant chemical, obstruction, not mechanical. The various endocrine disturbances were mentioned as a cause of sterility as well as the infantile type of development.

As to treatment in the female, cauterization of the cervix is to be recommended in preference to the Sturmdorf operation where either procedure is indicated, for in the latter procedure infected tissue is usually implanted higher in the cervical canal. Tubal insufflation is often a therapeutic measure as well as a diagnostic procedure. Alkaline douches may be recommended in high acidity of the cervical surfaces. Resection and end-to-end anastomosis of a tube is at times the necessary procedure. Suture of an ovary, with intact blood supply, into the fundic end of the uterus is unsuccessful and has been given up. Artificial insemination is not approved.

Galvanism is a most serviceable procedure in a so-called fibrous type of uterus. Of the different endocrine disturbances "subthyroidism" is the only type amenable to treatment, and the results here are sometimes quite gratifying. Ovarian medication is never to be used for sterility. Nothing can be done for the patient with infantile uterus.

Following a brief discussion by members of the society the meeting was adjourned.

E. E. HALLEY, *Assistant Secretary.*

KERN COUNTY

The regular monthly meeting of the Kern County Medical Society was held at the Kern County General Hospital on Thursday evening, September 15, the first meeting since May.

Meeting called to order by President McLain. There was a large percentage of the members of the society present who all joined in a symposium on infantile paralysis.

Doctor Cuneo, city health officer, discussed the new State Board of Health regulations. He also reported twenty-one cases of infantile paralysis during the past six months with seven deaths.

Dr. Joe Smith, county health officer, discussed the difficulty in enforcing some of the health regulations, particularly those regarding the handling and disposition of milk. He also reported having had eighty cases of infantile paralysis in Kern County during the past six months with ten deaths.

Meeting then adjourned to the banquet room where light refreshments were served and a general discussion had relative to quarantine of various diseases.

ROBERT M. JONES, *Secretary*.

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MARIN COUNTY

The Marin County Medical Society has had its summer vacation whether its individual members have had such or not. This month marks the beginning of our regular work.

We have found that the members will not take the trouble to attend a meeting unless an outside speaker presents a paper, and so we find the Extension Lecture Program extremely helpful. We hope that the program will continue to exist and grow in volume and increase in usefulness.

An interesting question came up a short time ago in regard to the use of high frequency and diathermy apparatus. When this apparatus is used all radio machines within several blocks are rendered useless during the time the high frequency apparatus is in use, and the question arises as to who has the "right of way."

If the youngsters are deprived of their "bedtime stories" or the older sports do not get their baseball returns, something is going to happen. I am told that in San Francisco there is an ordinance requiring owners of the offending instruments to use them in a lead-lined room, which would be rather an expensive way to overcome the nuisance. A lead-lined box might be employed, but would be cumbersome and awkward to use. Can any reader tell us how this situation is met in other towns?

This would appear to be a subject of considerable importance to the medical profession and of interest to the public at large.

W. F. JONES, *Secretary*.

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MERCED COUNTY

"The Action of the Human Heart in Health and Disease," illustrated by moving pictures of the living heart, was the topic of Dr. William Newman of San Francisco before the Merced County Medical Society at their first regular meeting of the season, held September 8 at the El Capitan Hotel, Merced.

Doctor Newman spoke in the place of Dr. Harry Spiro of Stanford University. He is an associate of Doctor Spiro, and the lecture is one prepared for the State Medical Society in May, 1928, according to Dr. H. Kylberg, secretary.

Including visitors there was an attendance of twenty-two doctors, the best attendance ever had. Those present were: Drs. F. R. DeLapp, councilor for this district, and J. A. Cooper, both of Modesto; C. E. Pearson and H. E. Meyer of Turlock; B. H. Bush of Los Banos; Jackson of Dos Palos; A. W. Gustofson, Gustine; Clarence Fitzgibbon, Merced Falls; W. E. Lilley, A. S. Parker, Chester Moyle, J. L. Mudd, Fred O. Lien, C. W. Kahl, E. R. Fountain, and H. Kylberg of Merced; W. C. Cotton of Atwater; Doctor Mead and F. P. Wisner of Chow-

chilla; and A. W. Meany, principal of the Merced high school as a guest of the Association.

Doctor Jackson of Dos Palos and Doctor Hughes of Gustine were admitted as new members.

The program presented was received with hearty appreciation and applause. Doctor Newman was detained in lively discussion by a number of members present until after midnight.

H. KYLBERG, *Secretary*.

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SAN DIEGO COUNTY

After a quiescent period of two months all the activities of the medical society and hospital staff organizations will be resumed in September. Meanwhile the summer months have witnessed a scene of unrest and migration on the part of the physicians. Fully 50 per cent of the physicians holding offices down town have changed their locations, many going into the new Medico-Dental Building, quite a few into the new John D. Spreckels Building.

A movement of some interest is the tendency on the part of small groups to get together and build their own offices in locations somewhat removed from the congested districts. Upper Fourth Street thus far has been selected as "Doctors' Row," and within the past year or two the following groups have established themselves in their own ground-floor offices:

Kinney and Elliott—X-ray and radium diagnosis and treatment.

Brown and Cornell—Ear, nose, and throat.

Rees, Stealy, McClendon, Cook, and Graham, a rather impressive group doing general medicine and surgery, and housed in one of the most complete buildings of its kind on the coast.

Sharp, Wood, and Sherrill—Pediatrics.

O'Neill and Tanner—General surgery.

Dement—Obstetrics.

Baxter—Internal medicine.

Thornton and Belford—Pediatrics.

Higbee—Ear, nose, and throat.

Carter and Bobbitt—General medicine.

This exodus from the downtown office buildings represents a protest against the high rentals and the difficult parking facilities there prevailing. Another form which the protest takes is the getting together of physicians and the building for themselves an office building provided with auto parking. San Diego physicians have not yet accomplished this; but there was open during the summer the first exclusive professional building in town which houses upward of one hundred physicians and dentists.

On the evening of September 10 the various tenants of the new Medico-Dental Building kept open house to all members of the two professions, when one could stroll about and see how the other fellows were quartered. Games and refreshments were indulged in up on the fourteenth floor, where rooms are provided for the medical library and a roof promenade. This library when established in its new quarters will be one of the most attractive libraries on the coast. Its windows facing east, west, and south present a perfect panoramic view of city, mountain, bay, and ocean. Medical visitors to San Diego are invited to make this their rendezvous with their friends.

Scripps Memorial Hospital held its first staff meeting since the summer vacation on the evening of September 6. Some interesting clinical cases were discussed and important business transacted, President Sherrill presiding.

On the evening of September 13 the County Medical Society was the guest of Captain Raymond Spear, Commandant of the Naval Hospital in Balboa Park, where after dinner a clinical program was presented by members of his staff.

Doctor Eaton, a representative of the American College of Surgeons spent a few days in San Diego early in September checking up on local hospital conditions and advising regarding hospital betterment.

ROBERT POLLACK.

SAN FRANCISCO COUNTY

The San Francisco Medical Society was fortunate in having as its guest speaker at the general meeting on September 13, Miss Justina H. Hill from Dr. Hugh Young's Clinic at Johns Hopkins. She spoke on "Recent Experimental Work with Mercurochrome—220," stating that work so far done shows that the action of mercurochrome—220 in streptococcus septicemias and pneumococcus infections is not bacteriocidal, but is concerned in some manner with immune reactions, as normal horse serum mercurochrome mixtures were found to be more effective than mercurochrome or serum alone. Further work is to be done.

St. Joseph's Hospital staff held its monthly meeting at the hospital on September 14 at 8:30 p. m. Case reports were presented by the following members: Roy Parkinson (lateral sinus thrombosis), J. M. Stowell (sarcoma of lung, gastric ulcer and empyema), and Ethan Smith (multiple fractures and massive hernia). Ernst Gehrels showed a patient upon whom a Kraske operation for rectal carcinoma had been done and F. H. Redewell spoke upon the subject of "Diverticulum of the Bladder" illustrating the paper by lantern slides and showing a patient in the hospital suffering from this lesion.

T. HENSHAW KELLY, *Secretary*.

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SAN JOAQUIN COUNTY

The stated meeting of the San Joaquin County Medical Society was held at the Medico-Dental clubroom, 242 North Sutter Street, Stockton, Thursday, September 1, at 8 p. m. The meeting was called to order at 8:30 p. m. Dr. George H. Sanderson presiding. Twenty-four were in attendance.

The chairman introduced Doctor Woolf, who spoke on the subject "Proctological Surgery." Doctor Woolf gave a general résumé of the modern viewpoint of proctology. His interesting and instructive talk included:

1. General surgical anatomy of the rectum and anus.
2. Modern treatment of hemorrhoids, abscess, fistula, and fissure.
3. Tumors of the rectum.
4. Differential diagnosis from cancer of rectum.
5. Type of operation desirable in malignant disease.

The doctor showed a patient upon whom he had performed an operation for cancer of the rectum. Those present asked many questions, which the doctor answered in a very practical way.

After the scientific program the minutes of the previous meeting were read and approved.

The board of directors of the society recommended that the medical society endorse the action of the ethics committee as stated in their letter of June 23, 1927, and that any member of the society who continues to render services to the Pacific Health and Hospital Service Corporation or similar organizations shall be suspended from the society.

Action—G. H. Rohrbacher moved, seconded by H. E. Kaplan, that the society accept the recommendation of the board of directors.

Moved by E. L. Blackmun, seconded by C. A. Broadbudd, to amend the motion by striking out the clause, "Shall be suspended from the society." The amendment was lost; the main motion carried.

The meeting adjourned at 11:10 p. m.

FRED J. CONZELMANN, *Secretary*.

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SAN MATEO COUNTY

The San Mateo County Medical Association opened the new year with a barbecue Wednesday evening, September 7, at Camp Sawyer, Dr. W. C. Chidester acting as host. Mr. Springer, a lawyer from Palo Alto, gave a very interesting dissertation on the common mosquito. A few stories and songs followed, after which we adjourned.

Dr. A. L. Offield has been appointed to the position of chief of staff at the Community Hospital to fill

the place left vacant by the death of his brother-in-law, Dr. Wood C. Baker.

H. WADE MACOMBER, *Secretary*.

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SONOMA COUNTY

The Sonoma County Medical Society held the regular meeting on September 8. The society was entertained at dinner by the Santa Rosa Clinic at 7 p. m. in the Elks' Club.

A short business session preceded an excellent paper by Dr. William W. Washburn of San Francisco on the diagnosis and surgery of tumors of the neck, which was illustrated by a fine collection of lantern slides.

J. LESLIE SPEAR, *Secretary*.

CHANGES IN MEMBERSHIP

New Members—San Diego County—Raymond C. Lindholm, San Diego.

San Francisco County—Glenn F. Cushman, Albert D. Davis, William C. Frey, Thomas E. P. Gocher, Robert L. Groves, Charles T. Hayden, Berthel L. Henning, George C. Hensel, Grace M. McKellips, Harry Partridge, Pleasant A. Taylor, Stuart C. Way, Alfred H. Washburn (associate), San Francisco.

Stanislaus County—Preston C. Byington, Modesto. Yolo-Colusa County—Reinhard V. Looser, Vincent E. Wagner, Woodland.

DEATHS

Bishop, Frank Crowell. Died at Los Angeles, September 3, 1927, age 44 years. Graduate of College of Physicians and Surgeons, Los Angeles, 1914. Doctor Bishop was a member of the Los Angeles County Medical Society, the California Medical Association, and Fellow of the American Medical Association.

Rantz, Stephen Hester. Died at Placerville, September, 1927, age 60 years. Graduate of the University of California Medical School, 1893. Doctor Rantz was a member of the Placer County Medical Society, the California Medical Association, and Fellow of the American Medical Association.

Wernick, Reinhard. Died at Los Angeles, August 24, 1927, age 66 years. Graduate of the Rush Medical College, Chicago, 1881. Licensed in California, 1887. Doctor Wernick was a member of the Los Angeles County Medical Society, the California Medical Association, and Fellow of the American Medical Association.

IN MEMORIAM

Wood Carson Baker was born in Maxwell, Colusa County, California, July 21, 1877. His preliminary education was received in the schools of Colusa County.

He was graduated from Cooper Medical College in 1903. He served his internship in the Southern Pacific Hospital in San Francisco, and one year as resident physician at the same place.

He was married in San Francisco to Leona Offield, December 27, 1905. In 1906 they settled in San Mateo where he practiced his profession until the time of his death on August 17, 1927.

He was the surgeon in charge of the San Mateo County Hospital since 1910, and medical superintendent of the new Community Hospital since 1923, where his work among the poor was greatly appreciated by the people of the county.

Doctor Baker served as a captain for the Medical Corps during the World War, being stationed at Letterman Hospital a portion of the time.

He was a member of the San Mateo County Medical Society, the California Medical Association, and American Medical Association.

He was also a member of the Kiwanis Club, the Elks' Lodge, Masonic Lodge, the Shrine, and the American Legion.

He will long be missed by his fellow members of the County Medical Society, and a great following of friends for his jovial and happy personality.

EXTENSION LECTURE PROGRAM

Authors and Subject Index

Harry E. Alderson, M.D., and Stuart C. Way, M.D., 320 Medico-Dental Building, 490 Post Street, San Francisco.

1. The Determination of Malignancy in Tumors of the Skin. (Lantern slides.)
2. Dermatoses Commonly Seen in General Practice. (Lantern slides.)
3. A Skin and Syphilis Clinic Will Be Held of Locally Selected Cases (five or six).

Hans Barkan, M.D., 921 Medico-Dental Building, 490 Post Street, San Francisco.

1. Headaches Due to Ocular Causes.
2. Industrial Aspects of Eye Injuries.
3. Modern Methods of Cataract Operations.
4. Short-Sightedness, Its Medical and Sociological Aspects.

Leo P. Bell, M.D., Woodland Clinic, Woodland.

1. Diseases of the Spleen and Their Treatment.
2. Preoperative Preparation and Surgical Treatment of Exophthalmic and Thyrotoxic Goiter.
3. Diagnosis and Surgical Treatment of Carcinoma of Rectum and Sigmoid.
4. The Surgical and Medical Significance of Dyspepsia.

LeRoy Brooks, M.D., 731 Medico-Dental Building, 490 Post Street, San Francisco.

1. Technique of Aseptic End to End Anastomosis of the Intestine.
2. Surgical Treatment of Goiter.
3. The Importance of Fluids, Alkali, and Acid Balance in the Treatment of Surgical Patients.
4. The Overtaxed Liver in Peritonitis.

Philip King Brown, M.D., 401 Medical Building, 909 Hyde Street, San Francisco.

1. Unusual Effects of Local Infections.
2. The Treatment of Some Illustrative Cases of Pernicious Anemia Treated by Minot-Murphy Diet.
3. A Series of Leukemias Treated with X-ray and the Treatment of Polycythemia.
4. Cases Simulating Glandular Insufficiencies.

Joseph Catton, M.D., 609 Howard Building, 209 Post Street, San Francisco.

1. The Doctor in Court.
2. The Patient Who Has the Disease versus the Disease the Patient Has.
3. Vegetative Nervous System; Practical Considerations.
4. Encephalitis; In General Practice.

Ernest S. du Bray, M.D., 1251 Flood Building, 870 Market Street, San Francisco.

1. Benign Glycosurias, Their Significance and Differentiation from True Pancreatic Diabetes.
2. Modern Views of the Chronic Nephropathies.
3. Criteria for Prognosis in Hypertensive Cardiovascular Disease.

Rex Duncan, M.D., 204 Professional Building, 1052 West Sixth Street, Los Angeles.

1. What the General Practitioner Should Know About Cancer.
2. Treatment of Uterine Cancer with Observation of More Than 500 Cases Treated During the Past Ten Years.
3. Treatment of Lip and Superficial Epitheliomata.
4. Diagnosis and Treatment of Breast Cancer.

L. A. Emge, M.D., 507 Union Square Building, 350 Post Street, San Francisco.

1. Dysmenorrhea and Its Treatment.
2. Rational Therapy for Vaginal Discharge.
3. The Treatment of Sterility.
4. Endometritis, Its Treatment and Symptomatology.

Franklin Farman, M.D., 709 California Medical Building, 1401 South Hope Street, Los Angeles.

1. The Diagnosis and Treatment of Kidney and Ureteral Stones. (Lantern slides.)
2. Chronic Prostatitis.
3. Aberrant Renal Artery as a Cause of Hydronephrosis. (Lantern slides.)

Paul A. Ferrier, M.D., Professional Building, 65 North Madison Avenue, Pasadena.

1. Tuberculosis of the Urinary System.
2. Tumors of the Bladder.
3. Control of Hemorrhage with Particular Reference to the Urinary System.

Ernst Gehrels, M.D., Medico-Dental Building, 490 Post Street, San Francisco.

1. Local Anesthesia for Abdominal Operations, Especially Splanchnic Anesthesia.
2. The Radical Surgical Treatment of Gastric and Duodenal Ulcer.
3. The Treatment of Gall Stones in the Common Duct.
4. Operative Mobilization of Ankylosed Joints, Especially the Knee Joint.

Thomas E. Gibson, M.D., 738 Flood Building, 870 Market Street, San Francisco.

1. The Diagnosis of Adrenal Tumors. (Lantern slides.)
2. Improvements in Perineal Prostatectomy Permitting Primary Wound Closure and Healing of Wounds Without Drainage. (Lantern slides.)

Edgar Lorrington Gilcreest, M.D., 315 Fitzhugh Building, 384 Post Street, San Francisco.

1. Conservatism in the Treatment of Fractures.
2. Treatment of Fractures in the Neighborhood of Joints.

A. Gottlieb, M.D., 1240 Roosevelt Building, 727 West Seventh Street, Los Angeles.

1. Sun Therapy in Bone Tuberculosis.
2. Osteochondritis—Kochler's Disease, Perthes' Disease, Osgood-Schlatter's Disease, etc.
3. Painful Heel—Bursitis About the Heel.
4. Lord Lister and the Renaissance of Surgery.

Richard W. Harvey, M.D., 711 Fitzhugh Building, 384 Post Street, San Francisco.

1. Combined System Disease. (Lantern slides.)
2. The Case of the Mental Patient.
3. Medical Aspects of Certain Problem Cases.
4. The Neurotic Patient.

Arthur W. Hebert, M.D., 819 Flood Building, 870 Market Street, San Francisco.

1. Para-Nasal Sinus Disease in Children, Manifestation, Diagnosis, and Treatment. (Lantern slides.)
2. Ailments Resulting from Para-Nasal Sinus Disease. (Lantern slides.)
3. The Relation of Para-Nasal Sinus Disease to Asthma and Hay Fever. (Lantern slides.)
4. Headaches of Nasal Origin. (Lantern slides.)

Samuel H. Hurwitz, M.D., 1214 Medico-Dental Building, 490 Post Street, San Francisco.

1. The Relative Importance of Hypersensitiveness and Infection in Bronchial Asthma.
2. Diagnosis and Treatment of Bacterial Asthma.
3. The Rhinological Aspects of Hay Fever and Asthma.

Louis Clive Jacobs, M.D., 462 Flood Building, 870 Market Street, San Francisco.

1. Diagnosis and Treatment of Lesions of the Posterior Urethra. (Lantern slides and wax models.)
2. The Surgical Prostate and Its Complications. (Lantern slides.)
3. The Infected Prostate and Its Relation to Focal Infection.
4. Calculi of the Urological Tract.

W. H. Kellogg, M.D., State Hygienic Laboratory, Berkeley.

1. The Prevention of Diphtheria and Scarlet Fever.
2. The Practice of Preventive Medicine.
3. Anaphylaxis.
4. Serums and Vaccines.

William J. Kerr, M.D., University of California Hospital, San Francisco.

1. Treatment of Heart Disease.
2. Diagnosis and Medical Treatment of Goiter.
3. The Cardiac Irregularities, Their Recognition, Treatment, and Prognosis. (Lantern slides.)
4. Liver Function Tests. (Lantern slides.)

Alson R. Kilgore, M. D., 724 Medico-Dental Building, 490 Post Street, San Francisco.

1. Present Tendencies in Cancer Research and Their Clinical Significance.
2. Breast Cysts and Their Relation to Cancer. (Lantern slides.)
3. The Indications for Neck Dissection in Mouth and Lip Cancer.

Eugene S. Kilgore, M. D., 724 Medico-Dental Building, 490 Post Street, San Francisco.

1. Cardiac Pain—Clinical Types and Significance.
2. The Assessment of Circulatory Efficiency.
3. Cardiac Neuroses.
4. The Contribution of Graphic Methods to the Practical Handling of Heart Cases.

Henry A. R. Kreutzmann, M. D., 1195 Bush Street, San Francisco.

1. Spinal Cord Bladders; Causes, Diagnosis, and Treatment. (Lantern slides.)
2. The Treatment of Large Renal Calculi. (Lantern slides.)
3. The Non-Surgical Treatment of Ureteral Calculi. (Lantern slides.)
4. Urology in Infants. (Lantern slides.)

Fred H. Kruse, M. D., 916 Fitzhugh Building, 384 Post Street, San Francisco.

1. Recent Advances in Diagnosis and Treatment of Gall Bladder Disease. (Lantern slides.)
2. Irritable Colon. (Lantern slides.)
3. Studies in Intestinal Bacteriology and Floras.
4. Peptic Ulcer; Etiology, Diagnosis, and Treatment. (Lantern slides.)

Robert William Langley, M. D., 802 Professional Building, 1052 West Sixth Street, Los Angeles.

1. Heart Disease and Its Relation to Obstetrics.
2. Fluoroscopic Study of the Heart. (Lantern slides.)
3. Chronic Heart Disease and Its Management.
4. Angina Pectoris.

E. Eric Larson, M. D., Woodland Clinic, Woodland.

1. Treatment of Peptic Ulcer.
2. Treatment of Empyema.
3. Treatment of Prostatic Disease.

John D. Lawson, M. D., Woodland Clinic, Woodland.

1. Comparative Value of Gastro-intestinal Series and Cholecystography in Diagnosis of Gall Bladder Disease. (Lantern slides.)
2. Roentgen Therapy in Treatment of Erysipelas.
3. Use of Radiation in Conjunction with Colloidal Lead in Treatment of Malignancy.

Hans Lissner, M. D., 204 Fitzhugh Building, 384 Post Street, San Francisco.

1. Obesity in Children and Adults—Types and Treatment. (Lantern slides.)
2. Recognition and Treatment of Myxedema. (Lantern slides.)
3. Endocrine Disturbances of Menstruation. (Lantern slides.)
4. Roentgenology as an Aid in the Diagnosis of Ductless Gland Disease. (Lantern slides.)

Stanley H. Mentzer, M. D., Physicians' Building, 516 Sutter Street, San Francisco.

1. What are the Criteria for Cholecystectomy in Cholelithiasis? (Lantern slides.)
2. Cholesterosis of the Gall Bladder; Its Treatment. (Lantern slides.)
3. The Diagnosis and Treatment of Acute Cholecystitis. (Lantern slides.)
4. The Present Status of Gall Bladder Surgery. (Lantern slides.)

V. H. Podstata, M. D., The Livermore Sanitarium, Livermore.

1. The Unusual (Problem) Child.
2. The Varieties of Incipient Mental Depression. (Doctor Podstata not available on Tuesdays.)

D. Schuyler Pulford, M. D., Woodland Clinic, Woodland.

1. Alkalosis from Upper Intestinal Obstruction. (Lantern slides.)
2. The Colloidal Lead Treatment of Malignancy.
3. Dietary Treatment of Epilepsy. (Lantern slides.)
4. The Prevention and Classification of Goiter (Lantern slides.)

J. Marion Read, M. D., 1183 Flood Building, 870 Market Street, San Francisco.

1. Blood Pressure—Physiological and Clinical Aspects of Abnormal Pressures. (Lantern slides.)
2. The Patient with a Goiter. (Lantern slides.)
3. The Management of Graves' Disease. (Lantern slides.)

Francis H. Redewill, M. D., 1117 Flood Building, 870 Market Street, San Francisco.

1. Hugh H. Young, M. D., the Father of Modern Urology.
2. The Urological Equipment of a Modern Hospital. (Lantern slides.)
3. Diverticulum of Urinary Bladder, Etiology, Diagnosis, Treatment. (Lantern slides.)
4. Ureteral Transplantation—Methods, Indications, Results. (Lantern slides.)

Alfred C. Reed, M. D., 715 Fitzhugh Building, 384 Post Street, San Francisco.

1. Amebiasis for the California Physician.
2. The Importance of Tropical Medicine in California.
3. The Periodic Health Examination with Demonstration.
4. Pernicious Anemia.

Robert Lewis Richards, M. D., 409 Fitzhugh Building, 384 Post Street, San Francisco.

1. Experience in First Aid to Mental Patients.
2. The Blind Spot in Medicine.
3. Dangerous Mental Ages.
4. The Thyroid and Mental States.

F. W. Rinkenberger, M. D., 703 Brockman Building, 520 West Seventh Street, Los Angeles.

1. Ulcer and Carcinoma of the Stomach.
2. Thyroid Diseases and Their Surgical Treatment.
3. Surgery in the Diabetic Patient.
4. Hernia.

Hobart Rogers, M. D., 3135 Webster Street, Oakland.

1. Practical Aspects of Cardiology.

Max Rothschild, M. D., 704 Ritzhugh Building, 384 Post Street, San Francisco.

1. The Early Diagnosis of Pulmonary Tuberculosis.
2. The Diagnosis and Treatment of Tuberculosis of Bronchial Glands in Children. (Lantern slides.)
3. The Treatment of Tuberculosis with Specific Remedies. (Lantern slides.)
4. The Treatment of Tuberculosis with Nonspecific Remedies, with Special Reference to Pneumothorax Treatment. (Lantern slides.)

Albert H. Rowe, M. D., 242 Moss Avenue, Oakland.

1. Diagnosis and Treatment of Seasonal and All-Year-Round Type of Hay Fever and Bronchial Asthma. (Lantern slides.)
2. Food Allergy as a Cause for Migraine and Indigestion.
3. Allergic Dermatitis and Eczema.
4. Diabetes Mellitus—Its Diagnosis and Treatment.

John J. Sampson, M. D., 510 St. Paul Building, 291 Geary Street, San Francisco.

1. Heart Sounds and Murmurs. An Analysis of Their Clinical Significance by Electrical Stethoscope Records. (Lantern slides.)
2. Problem of Heart Disease in Public Health.
3. Methods of Circulation Measurement; Cardiac and Peripheral Vessel Experiments of the Past Year; Their Relationship to Future Clinical Cardiology.

C. O. Sappington, M. D., 602 Hutchinson Building, 1705 Broadway, Oakland.

1. Industrial Hygiene as a Specialty of Modern Preventive Medicine. (Lantern slides.)
2. Periodic Health Examinations in Private Practice. (Lantern slides.)
3. The Administrative and Technical Problems of Industrial Medicine. (Lantern slides.)
4. The Reasons for Coordination Between Health Supervision in Schools and Industries.

Harry Spiro, M. D., 501 Flood Building, 870 Market Street, San Francisco.

1. Angina Pectoris, Treatment and Diagnosis.
2. The Use of Quinidine in Cardiac Irregularity.
3. Interpretation of Various Cardiac Murmurs.

4. Consideration of Heart Action in Health and Disease. (Moving pictures of the living animal heart.)

William E. Stevens, M. D., 602 Flood Building, 870 Market Street, San Francisco.

1. Tuberculosis of the Kidney.
2. Urinary Calculi.
3. Urology in Women.
4. Medical and Surgical Conditions of the Urinary Tract During Infancy and Childhood.

Steele F. Stewart, M. D., 817 Westlake Professional Building, 2007 Wilshire Boulevard, Los Angeles.

1. Convalescent Care of Infantile Paralysis.
2. Recent Developments in the Treatment of Spastic Paralysis.

H. J. Templeton, M. D., 3115 Webster Street, Oakland.

1. Dermatologic Manifestations of Syphilis. (Lantern slides.)
2. Diagnosis and Treatment of Syphilis. (Moving pictures—three reels.)
3. Common Dermatoses. (Lantern slides.)
4. Malignancies of the Skin; Treatment by Electrothermic Methods; Demonstration of Modalities Used.

E. B. Towne, M. D., Union Square Building, 350 Post Street, San Francisco.

1. Injuries of the Brain and Spinal Cord.
2. Tumor of the Brain and Spinal Cord.
3. Tic Douloureux.
4. Injuries of Peripheral Nerves.

William C. Voorsanger, M. D., 1001 Medico-Dental Building, 490 Post Street, San Francisco.

1. Undiagnosed Cough—A Study of 200 Patients. (Lantern slides.)
2. Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis.
3. Recent Advances in the Diagnosis of Pulmonary Tuberculosis.
4. Pulmonary Abscess; Classification, Prognosis, and Treatment. (Lantern slides.)

James T. Watkins, M. D., 212 Medical Building, 909 Hyde Street, San Francisco.

1. Reconstruction Operations for Ununited Fractures of the Femoral Neck.
2. Tuberculosis of the Hip; the Surgical Treatment of.
3. Diagnosis of Infantile Paralysis.
4. Surgical Treatment of Infantile Paralysis.

Miley B. Wesson, M. D., 1275 Flood Building, 870 Market Street, San Francisco.

1. Swollen Testicle—Possibilities, Differential Diagnosis and Treatment. (Lantern slides.)
2. Catarrh of the Bladder—Possibilities, Differential Diagnosis and Treatment. (Lantern slides.)
3. Blood in the Urine—Possibilities, Differential Diagnosis and Treatment. (Lantern slides.)
4. Backache Secondary to Genito-Urinary Infections. (Lantern slides.)

J. Homer Woolsey, M. D., 907 Medico-Dental Building, 490 Post Street, San Francisco.

1. Gastric Function. (Lantern slides.)
2. Diagnosis and Treatment of Peptic Ulcer. (Lantern slides.)
3. Choice of Surgery in Peptic Ulcer. (Lantern slides.)
4. Wound Infections.

Dermatology and Syphilology

Alderson, H. E. Templeton, H. J.

Way, Stuart C.

Endocrinology

Lisser, Hans

Eye, Ear, Nose, and Throat

Barkan, Hans Hebert, Arthur W.

General Subjects for Lay Audiences

Gilcreest, Edgar Lorrington

Gynecology and Obstetrics

Emge, L. A.

General Medicine

Brown, Philip King

du Bray, Ernest S.

Hurwitz, Samuel H.

Kerr, William J.

Pulford, D. Schuyler

Read, J. Marion

Reed, Alfred C.

Sappington, C. O.

(a) Allergy

Rowe, Albert H.

(b) Carcinoma

Kilgore, Alson R.

(c) Cardiology

Kilgore, Eugene S.

Langley, Robert William

Rogers, Hobart

Sampson, John J.

(d) Gastro-Intestinal

Kruse, Fred H.

(e) Industrial

Sappington, C. O.

(f) Tuberculosis

Rothschild, Max

Voorsanger, William C.

Neuropsychiatry

Catton, Joseph

Harvey, Richard W.

Podstata, V. H.

Richards, Robert Lewis

Orthopedics

Stewart, Steele F.

Watkins, James T.

Preventive Medicine

Kellogg, W. H.

Public Health

Sappington, C. O.

Radiology

Duncan, Rex

Lawson, John D.

Surgery

Bell, Leo P.

Brooks, LeRoy

Gehrels, Ernst

Larson, E. Eric

Mentzer, Stanley H.

Rinkenberger, F. W.

Surgery (Brain and Spinal Cord)

Towne, E. B.

Woolsey, John Homer

Urology

Farman, Franklin

Ferrier, Paul A.

Gibson, Thomas E.

Gilcreest, Edgar Lorrington

Jacobs, Louis Clive

Kreutzmann, Henry A.

Redewill, Francis H.

Stevens, William E.

Wesson, Miley B.

NEVADA STATE MEDICAL ASSOCIATION

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TWENTY-FOURTH ANNUAL MEETING

The following program was given at the twenty-fourth annual meeting of the Nevada State Medical Association which was held September 23, 1927, at Bowers Mansion, Reno.

Friday, 9 a. m.

President's Address—William L. Samuels.

Alson R. Kilgore, San Francisco—Breast Cysts and Cancer. Discussion opened by C. W. West, C. C. Tiffin, and D. W. Sooy.

J. Larue Robinson and Earl L. Creveling, Reno—Magnetic Extraction from Within the Globe. Discussion opened by D. K. Pischel, D. L. Shaw, and J. A. Fuller.

Dohrmann K. Pischel, San Francisco—Demonstration of the Hess Curtain for the Diagnosis of Palsies of the Extrinsic Ocular Muscles. Discussion opened by J. L. Robinson, D. L. Shaw, and J. A. Fuller.

W. B. Coffey, San Francisco—Angina Pectoris—Anatomy, Physiology, and Surgical Procedure. Discussion opened by D. S. Pulford, Donald Maclean, and J. D. Humber.

D. Schuyler Pulford, Woodland, Cal.—The Clinical and Pathological Classification of the Common Types of Goiter.

Daniel W. Sooy, San Francisco—Clinical Considerations of Goiter.

Charles C. Tiffin, Seattle, Wash.—Thyroid Disease. Discussion of last three papers opened by V. A. Muller, W. B. Coffey, and S. H. Hurwitz.

William A. Shaw, Elko—Acromio-Clavicular Dis-

location. Discussion opened by J. T. Watkins, R. R. Craig, and E. L. Gilcreest.

Samuel H. Hurwitz, San Francisco—The Applications of Allergy in Practice. Discussion opened by S. K. Morrison, A. R. Kilgore, and C. F. Welty.

Business Meeting

Friday Evening at 8 o'clock, Council Chamber, City Hall, Reno

Registration and payment of dues.

Reading of minutes of last annual meeting.

Reports of delegate to A. M. A.

Reports of various committees.

Election of officers.

Officers to be elected—a president, two vice-presidents, secretary-treasurer, and one trustee.

Saturday, September 24, 9 a. m., Bowers Mansion

Robert P. Roantree, Elko—Torsion of the Spermatic Cord. Discussion opened by W. E. Stevens, J. W. Gerow, and Lewis Michelson.

Miley B. Wesson, San Francisco—Confusing Cystograms and Pycelograms. Discussion opened by R. A. Bowdle, W. A. Shaw, and S. M. Sproat.

Lewis Michelson, San Francisco—Obscure Pain in the Lower Abdomen Due to Stricture of the Ureter. Discussion opened by W. E. Stevens, B. H. Caples, and R. P. Roantree.

William E. Stevens, San Francisco—Medical and Surgical Urology in Infants and Children. Discussion opened by M. B. Wesson, L. Michelson, and John Tees.

Thomas Wilbur Bath, Reno—Endocervicitis—Etiology, Pathology, and Treatment. Discussion opened by Emmet Rixford, S. K. Morrison, and A. R. DaCosta.

Edgar L. Gilcreest, San Francisco—Cults and Cures. Discussion opened by T. W. Bath, G. W. Pierce, and W. H. Hood.

George Warren Pierce, San Francisco—Treatment of Cleft Palate and Hare-Lip. Discussion opened by A. L. Stadtherr, W. B. Coffey, and A. F. Adams.

B. C-N. O'Reilly, San Francisco—Treatment and Prognosis of Wassermann Fast Cases. Discussion opened by B. H. Caples, A. L. Grover, and M. B. Wesson.

I. S. Egan, Goldfield—The Neurotic and Irritable Abdomen. Discussion opened by R. A. Bowdle, W. W. Washburn, and C. E. Swezy.

Luncheon was served Friday and Saturday at the Mansion. A banquet at the pavilion at Lawton Springs was held at 9 p. m., Saturday.

UTAH STATE MEDICAL ASSOCIATION

W. R. CALDERWOOD, Salt Lake.....President
E. H. SMITH, Ogden.....President-Elect
FRANK B. STEELE, Salt Lake.....Secretary
J. U. GIESY, 701 Medical Arts Building, Salt Lake.....Associate Editor for Utah

OFFICIAL NOTICES

Change in Editorial Make-Up—In the future there will be a decided change in the make-up of the Utah section, in harmony with the wishes of the editorial staff as expressed to the associate editor for Utah, in a letter of recent date.

The editorials will be eliminated. The section will cover first, official notices from the state secretary or other state officers. In the order named will then follow, reports of societies, changes in membership, notices of deaths, and obituaries.

This means simply that, unless the secretaries of the component societies in the state association wake up and get in some news before the tenth of each month, there will not be very much in the Utah section.

Ever since the present editor had the job wished upon him he has been trying to coax the various county societies to report their meetings and other items of interest. He has failed. And now unless there is some support given the Utah section will fail

also. *Verbum sap.* But the editor shall follow the pleasure of the editorial staff, and if nobody wants to furnish news, then there will be no news.

In lieu of the editorials which the present editor has been writing for the past four years, he is now authorized to invite a limited number of the medical men of the state to submit comment on timely subjects of medical interest to be printed in the section "Medicine Today," which you will find in each issue now as for some time in the past. The editor hopes that some men will come forward with articles of interest for this section within the next few weeks.

In view of the fact that all material must be in the hands of the printers by the 15th, this number will contain few reports on medical societies, owing to the fact that the material cannot be obtained by the regular publication date.

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COMPONENT COUNTY SOCIETIES

The first regular meeting of the Salt Lake County Medical Society was held at the L. D. S. Hospital on the evening of September 12. The program was arranged by the hospital staff. A more complete account will appear from the local secretary, M. M. Critchlow, later, the meeting having occurred at a date such as to prevent his getting copy into the hands of the editor in time to be included in the present issue.

*

Minutes of the Salt Lake County Medical Society, Salt Lake City—The regular meeting of the Salt Lake County Medical Society was held at the L. D. S. Hospital, Monday, September 12, 1927.

Meeting was called to order at 8 p. m. by President W. G. Schulte. Forty-three members and four visitors were present.

The minutes of the previous meeting were read and accepted without correction.

Clarence Snow, chairman of the medical staff of the L. D. S. Hospital, took the chair and introduced the speakers.

F. F. Hatch presented a woman upon whom he had operated for calculus and pyonephrosis. Pathological specimen was shown by L. L. Daynes and shown to contain malignant growth, in addition to the other pathology.

H. T. Anderson presented a man afflicted with general paresis who has greatly improved by inoculation with the malaria parasite. The case was discussed by H. S. Scott. Leland Cowan discussed bone tumors, especially Ewing tumors, which he demonstrated with lantern slides.

J. E. Tyree presented x-ray films of multiple myelomata of the skull. He also showed pathological specimen of a rodent ulcer of the scalp, with invasion of the skull. He also gave a very interesting talk on hemorrhage from the middle meningeal artery.

Applications for membership, signed by Q. R. Coray and Albert Leigh, were read.

A communication from the U. S. F. and G. Company of Baltimore was read and tabled.

Adjournment at 9:30 p. m.

M. M. CRITCHLOW, Secretary.

*

The Holy Cross Clinical Association held their regular monthly meeting—the first of the fall term—on the night of Monday, September 19, in the Assembly room of the hospital.

Doctor Schulte read a paper, and Doctor Ward presented an interesting case report.

Medicine in Africa—There is a movement afoot, according to foreign press reports, to teach medicine to competent natives in South Africa so that they may practice among their own people. A prominent Johannesburg physician recently advocated such a plan, citing the experience of the Dutch East Indies, where the native doctor experiment has worked out successfully. Native doctors, it is said, would possibly reduce the great evil of witchcraft, which now assists the spread of epidemics of disease among the natives. —M. J. and Record.

MISCELLANY

From time to time in this department of California and Western Medicine, appear columns grouped under the following headings: Comment on Current and Recent Articles in this Journal; History of Medicine; News; Medical Economics; Readers' Forum; California State Board of Health; and California Board of Medical Examiners. For Book Reviews, see index on the front cover, under Miscellany.

CURRENT COMMENT

FAIRNESS*

Statistics show that the tendency to claim damages from physicians and surgeons for their alleged sins of omission and commission is increasing. Some ascribe this tendency entirely to the influence of the cultists who are ever ready with criticism of scientific methods in medicine and surgery. To a large extent this undoubtedly is the explanation. However, I am of the opinion that this age of hurry and bustle, rapid transportation and modern activity, with a resultant increase in hazards, has created a situation where each man endeavors to hold the other fellow responsible and to obtain from him, if possible, compensation. This is encouraged by the increase in the various types of insurance which have been forced upon those whose occupations or activities carry with them possible accidents. Without due consideration of the justice of the claim, action is brought to recover. In fact, no allowance is made for human imperfections. I shall expect a word of thanks from the insurance people for advising insurance on everything, including life, possessions and conduct. While the burden of paying the premiums may at times irritate, it is the only way one can now live comfortably and safely. While universal insurance doubtless to some extent encourages the thing it in turn protects, we must have it.

I believe our best protection for alleged malpractice lies in a good insurance policy. Be sure that it covers everything, especially the x-ray. Even if we do not apply the x-ray for treatment or diagnosis ourselves, should we advise our patient to go to an x-ray laboratory for its use and there be an accident, it may be claimed that we are as responsible in the eyes of the law as the actual technician.

In addition, I believe membership in the California Medical Society is very desirable. While it does not provide indemnity if an adverse judgment is had, it does provide to deserving members defense by legal talent whose experience makes them of the best. It gives in all proper cases the active assistance of the society, and of every member thereof, the support of those who are friends and associates, those who are personally interested in your welfare.

In this connection a brief discussion of ethics is opportune. Accidents will happen. To say that there are no sins of omission or commission cannot be true when we know that to err is human; but in the main we are sure if an error is com-

* Excerpt from an address at the Monterey County Medical Society, September 2, by Percy T. Phillips, M. D.

mitted it is not through carelessness or ignorance. How easy it is for the physician or surgeon who is called in to take charge of a case that is not progressing satisfactorily, without saying a word, to convey the impression that the work has been poorly done. No doubt a large percentage of malpractice suits are inspired by impressions so made, a great many times inadvertently. Before any expression of opinion we should ascertain all the circumstances. Should we find there has been carelessness or negligence, it is not our place to defend; but where honest, intelligent effort has been used, it is our duty to our profession and its individual members to put forth every effort to uphold the methods that were used and to protect against criticism a result that, while not perfect, is the best that was obtainable under the circumstances. Should anyone be selfish enough to reason that a criticism of another's work will rebound to his glory and add to his practice he is mistaken. In the end, truth and fairness will prevail. We are only small units in a great and wonderful profession, and our welfare and prosperity depends on the reputation of the whole. Our happiness in our work depends on cordial, helpful relations with our confrères; sharp practices do not promote cordiality.

From the practical side, if confidence is lost in one member of the profession in a community, confidence in the entire profession of that community is lessened and the people think they must go elsewhere for better service. We must maintain adequate standards of education, training and conduct as well. We have a duty to our community as well as to ourselves, and we want the world to know we not only grow the best potatoes, sugar beets, and condensed milk, but also have the best physicians and surgeons, the lowest death rate and, in this day of one-piece bathing suits, the cutest appendectomy scars. I am discussing this particular phase of the ancient subject of ethics to impress upon our minds how easy it is for one physician inadvertently to precipitate another into a suit for alleged malpractice. And the resulting situation not only affects the individual sued, but reacts on the entire medical profession.

NEWS

Appointment of Doctor Muhl—The San Diego medical women are much elated over the signal honor which has been conferred upon one of their number in the appointment of Dr. Anita M. Muhl to the position of head of the Department of Special Education for the State of California. This is a new department being created by the State Board of Education, and Doctor Muhl's first duty will be to organize the de-

partment and map out her plan of procedure.—*San Diego County Med. Soc. Bulletin.*

Northern Medical Golf vs. Southern California Medical Golf—The Northern California Medical Golf Association will meet the Southern California Medical Golf Association in annual tournament at Del Monte and Pebble Beach on the week-end of October 29 and 30. Last year the North defeated the South, and the large plaque for which the annual contest is held is now in possession of the former, on display at the San Francisco County Medical Society Building. The southern organization will send up some very fine players, and the contest is sure to be a very close one this time. Those who attended last year will remember the various forms of entertainment provided and will be interested in knowing that greater preparations are being made for the coming event, and a much larger attendance is expected.

The following entertainment committee has been appointed:

John Hunt Shepard (chairman), San Jose; Herman J. Schlageter, Walter Schaller, San Francisco; Hugh Dormody, Monterey; Ream Leachman, Vallejo.

Members are advised to make their hotel reservations directly with the hotel as soon as possible.

CLARENCE A. DE PUY,
President.

HARRY E. ALDERSON,
Secretary-Treasurer.

New Method of Cancer Study—British physicians have evolved a method of cancer study by motion pictures which was described at a meeting of the British Empire cancer campaign held in the House of Lords, July 11. The cells are photographed over varying periods up to two days, and the film speeded up 906 times. The films are said to resemble those taken of unfolding flowers, and give a precise record of the growth of the cancer cells.—*Atlantic M. J.*

Regulation of Imported Milk—An act to regulate the importation of milk and cream into the United States for the purpose of promoting the dairy industry of the United States and protecting the public health, was passed at the last session of Congress. The enforcement of this act has been assigned to the Food, Drug, and Insecticide Administration, which also enforces the federal food and drugs act and certain other regulatory measures. The regulations for the enforcement of the milk act explain the procedure for making physical examination of cows, for applying the tuberculin test, for the sanitary inspection of dairy farms and of plants handling or shipping milk or cream, for the scoring of dairy farms or plants, for pasteurizing and determining the bacterial count, and outline the method for obtaining permanent permits required under the terms of the act.—*J. of the Missouri State Med. Assn.*

Children of Culion Leper Colony—In 1925 a plan for saving the uninfected children of the Culion leper colony in the Philippines was instituted by the office of the public welfare commissioner at Manila. In order to prevent these children from contracting leprosy from their parents they are removed from the colony and placed in institutions or private homes. By January, 1926, 285 children under 15 years of age had been removed. The youngest children are cared for in a public nursery near Culion, and if it is not possible to place the older ones with relatives or friends they are put in institutions where their care can be supervised by the office of the commissioner. Periodical health examinations are given to detect any early signs of leprosy which may appear. School training is provided and, as far as possible, the children are being prepared for happy, useful lives. They are encouraged to correspond with their parents, who are advised by monthly reports from the institution of their progress. This correspondence is deemed safe, since all letters sent from the leper colony are

thoroughly disinfected. The discovery of a cure for leprosy makes possible the hope that the children may eventually be restored to their parents.—*Journ. of Missouri State Med. Assn.*

Reports of Institutions for Feeble-Minded and Epileptics—The extent to which provision has been made for the institutional care of feeble-minded and epileptics is perhaps best indicated by the number of patients in the institutions on a given date. In the thirty-six states covered by this statement the number of feeble-minded and epileptic patients under institutional care shows a steady increase, as indicated by the figures for the dates at the beginning and the end of the two most recent years for which data are available, which are as follows: January 1, 1922, 39,596; January 1, 1923, 42,164; January 1, 1926, 49,788; and January 1, 1927, 52,043. The number of such patients under care per 100,000 of the general population increased from 47.0 on January 1, 1923, to 54.7 on January 1, 1927. For the most part the figures for the individual states show similar increases.—Department of Commerce Announcement.

An Expensive Smallpox Epidemic—A smallpox outbreak of 773 cases in Monmouthshire, England, reported in *The Medical Officer* for May 7, cost that municipality £10,000 for capital expenditure and equipment and £13,000 for the maintenance of two hundred beds for six months. In American money the total cost amounts to about \$112,000. The county medical officer, commenting on the outbreak, states that his position has not been rendered any easier by the opposition of an ill-informed and foolish section of the public, aided and abetted by the poisonous literature assiduously distributed through the post by spurious medical experts whose contribution to this epidemic will mean increased suffering and disfigurement and the expenditure of thousands of pounds unnecessarily.—*Colorado Med.*

University of California Study Adds to Medical Facts—As a result of a study just completed by Dr. Charles Atwood Kofoid, professor of zoology at the University of California, additional facts concerning the intestinal ameba or germs causing tropical dysentery and several common disorders of temperate climates have been uncovered which are of great importance in the diagnosis of infected cases and which will possibly aid in the eventual discovery of a cure.

Doctor Kofoid discovered that one type or species of ameba, which has been masquerading under the name *Endomeba dysenteriae*, is really of a different genus or classification and forms a separate species itself. Doctor Kofoid has given this new germ the name *Councilmania dissimilis*, to conform with the genus *Councilmania*, which he established several years ago, and of which *dissimilis* is the third species found.

In the bulletin on the subject just issued by the University Press, Doctor Kofoid explains that the new species is very similar to the pathogenic *Endomeba dysenteriae* in structure, but it has many differences disclosed by careful examination, particularly in its reproductive method.

A search for possible clinical and cultural differences between the *E. dysenteriae* and *C. dissimilis* is now being made, but at present its relation to the disease is problematical. In speaking of the proportion of the new germ to the *E. dysenteriae*, Doctor Kofoid said that not less than 25 per cent of the material studied was composed of *C. dissimilis*, and it occurs certainly with sufficient frequency to enter into problems of microscopical determination of specific infections.

Doctor Kofoid recognized the difference between the two types of amebae years ago, but has waited to verify his results. He has made as many as 78,000 examinations of 25,000 persons in the course of his research on the intestinal amebae of mankind.

At the present time Doctor Kofoid is in Europe reading reports on his work, including this new dis-

covery among other things. He is attending a meeting of the British Medical Association, International Congress of Zoologists at Budapest and International Conference on Genetics at Berlin.

A hint of its possible practical use in future work on dysentery was brought out by a Dr. E. Rodenwaldt of Java, who asserts his belief that the newly described ameba is very much more common there than here and that it appears to be pathogenic or disease causing.

Doctor Kofoid was assisted in his studies by a number of graduate students, including Inez Smith, Dr. Olive Swezy, and Mrs. Dora Henry.

MEDICAL ECONOMICS

State Health Insurance—In England and in Austria—Some recent reports have shown the trend which state health insurance takes once it is inaugurated. As indicating some of its effects upon members of the medical profession, the letter printed from the *Journal A. M. A.* from the column of its English correspondent, and the other item which appeared in one of the California newspapers, may not be without interest. The letter concerning the status of state health insurance in England reads as follows:

March 12, 1927.

GOVERNMENT AGAINST STATE MEDICAL SERVICE

In accordance with their socialistic views, the Labor party is always demanding the development of the national health insurance system into a complete state medical service in which the physician would be simply a government official. The attitude of the government is shown in a speech by Sir Kingsley Wood, parliamentary secretary to the ministry of health, at the opening of a convalescent home. He said that there was an increasing demand for convalescent home treatment, which had undoubtedly proved of great benefit. As a result of the second valuation of approved societies, an annual sum of \$1,000,000 had been provided for convalescent home treatment and, in addition, nearly \$1,500,000 a year for payment to hospitals. No fewer than 2200 schemes, already approved by the ministry of health, included payments for members going into convalescent homes. The number of members covered by societies in those schemes was nearly 10,000,000. On the hospital question the government stood firmly by the voluntary system. One of the best signs of the time was that during the last two years the voluntary hospitals had demonstrated their vitality. The government was wholly opposed to the creation of a state medical service. It would not be in anybody's interest to take the work done by the physicians of the country and put it in the hands of whole-time public servants. Nothing would be gained and much would be lost. Sickness was costing the nation a huge sum, and most of it was preventable. The nation should give more encouragement and recognition to research work. "Prevention" must be the great watchword of all our health services.

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The newspaper dispatch (*Los Angeles Herald*, vi, 9, 27), on the Austrian situation follows:

VIENNA DOCTORS THREATEN STRIKE

Vienna, June 9.—Austrian physicians threaten to go on strike unless negotiations now under way with the government increase their income. The larger part of the Austrian population is organized in vocational "Krankenkassen," a sort of compulsory governmental health insurance, and "Krankenkassen" hire the physicians at a regular salary to attend the sick. This salary, however, is as low as \$30 to \$45 a month. The unorganized population is so impoverished that it literally cannot afford to be sick enough to call a doctor; private practice is therefore small and not very lucrative.

The physicians now demand, first a raise of their "Krankenkassen" salary; second, exclusion from the

"Krankenkassen" of all those earning more than \$85 a month in order to create "private" patients.

* * *

If state medicine were inaugurated in America, similar experiences would probably result.

CALIFORNIA BOARD OF MEDICAL EXAMINERS

By C. B. PINKHAM, Secretary

Mention has recently been made in the newspapers of another "fellowship in the American College of Chiropractors" conferred on a chiropractor who has recently been prominently featured in connection with the "sleeping beauty" case. Correspondence from one of the leading chiropractors in the United States criticizes the "American College of Chiropractors," relating: "This publicity misrepresents the value of the fellowship degree which the man pays \$50 to get, and all he gets is a code of ethics which he signs and promises to follow, which any person can get and sign and frame for a two-cent stamp. . . ."—*"News Items,"* February, May, 1926.

Paul Bauer, practicing naturopath of Sacramento, has been cited to appear before the Board of Medical Examiners at the October meeting to show cause why his license should not be revoked based upon treatment given to Mrs. Anna Hoffman, a Sacramento woman who died August 6.

Dr. Frank Brigham, 42, prominent local physician, yesterday pleaded not guilty before Municipal Judge Guy Bush to a charge of possessing liquor, and his jury trial was set for September 19. The physician attracted the attention of Policeman McRae last Friday when at Western Avenue and Jefferson Street he refused to permit other autoists to pass his machine. Forcing the defendant to the curb, Officer McRae said he discovered a pint of liquor in the machine. Following his arrest Doctor Brigham declared he had a permit to carry five gallons of alcohol.—*Los Angeles Examiner*, August 28, 1927.

A forecast of the 1928 general election relates that among the laws to be placed before the people will be one submitted by the Progressive Chiropractors' Association: "The proposed law will require chiropractors to have a high school education and the equivalent of a college education: i. e., one year at a university and four thousand hours of instruction at a chiropractic college. It also will provide a jury trial in case of chiropractors who lose their license to practice, instead of permitting the State Board of Chiropractors to have full say, as at present. The amendment in addition will regulate chiropractic colleges as to requirements of education before pupils can be graduated, scientific laboratory and research equipment and requirements for chiropractic hospitals. . . ."—*Los Angeles Herald*, August 2, 1927.

Report of Special Agent Carter relates that on August 18 Georgia E. Day pleaded guilty in San Diego to a violation of the Medical Practice Act and was sentenced to pay a fine of \$100, suspended for two years on condition that she does not violate the Medical Act during that period.

According to an Associated Press dispatch dated Detroit, Michigan, August 13, published in the *San Francisco Examiner*, August 14, "a native-born German who claims to have served as a French spy during the World War was before authorities here today with the arrest of Carl H. Eifles, confessed impersonator of a Seattle, Washington, physician. He was arraigned on a charge of practicing medicine without a license. Eifles, who is said to have performed thirty major operations here, was held in the county jail in default of \$2000 bond after pleading guilty. Police declared that he is wanted in several

cities on charges ranging from issuing worthless checks to breaking jail." The Michigan Board of Medical Examiners relates a most interesting story about how this individual, using the name of a duly licensed practitioner, is reported to have obtained licenses to practice by impersonation. This is another practical demonstration of the necessity for extreme care in scrutinizing credentials of all applicants for a license to practice.

Our Investigation Department recently had occasion to look into the activities of Ernestine Englehardt, who poses as a cancer specialist in Oakland, using in her advertising matter the prefix "Dr.," she having no authority to treat ailments of the human system under the Medical, Osteopathic, or Chiropractic boards.

J. Paul Fernel, M. D., whose reciprocity application based on his Illinois credentials, was denied by the Board of Medical Examiners at the June meeting, based upon our investigation of his record in Illinois and Michigan, recently brought a writ of review in the courts of Los Angeles in an endeavor to set aside the board's action. The Superior Court sustained the board, and his attorneys have again appealed.

George E. Hall, who has been practicing chiropractic work at Camp del Dios, where he resided, was fined Tuesday in San Diego for practicing without a license. The judge assessed a \$50 fine. Hall's operations in this section were investigated by George M. Wynne, special agent of the State Board of Chiropractic Examiners.—*Escondido Times-Advocate*, August 18, 1927.

Dr. George Jarvis, 240 Stockton Street, was arrested last night after he is alleged to have failed to make a report to police of a stabbing affray in a hotel at 702 Vallejo Street. . . .—*San Francisco Examiner*, August 13, 1927.

William Lorimer Jones, M. D., of Oakland has been cited to appear before the board at the October meeting to show cause why his reciprocity license to practice in the state of California should not be revoked, based upon a narcotic charge in the state from which he came.

According to the report of our Special Agent Carter, Clarence M. King, a licensed chiropractor of San Diego, recently pleaded guilty in San Diego to a charge of violation of the Medical Practice Act and was sentenced to six months in the county jail, sentence being suspended for two years on condition that he does not violate the Medical Practice Act. He also pleaded guilty to a charge of violating the State Poison Act, having hypodermic needles in his possession, and was fined \$25. Complaint was also filed against him for violating the State Poison Act, having morphin in his possession, to which he also pleaded guilty and was sentenced to one year in the county jail, sentence being suspended on condition that he not violate the State Poison Act for a period of two years. Commenting on this, the *Ramona Sentinel* of August 26, 1927, relates: "The alleged offenses were committed merely in a desire to serve his patients and constituted a technical violation of the law that was not important and without any intention of wrongdoing."

William McBride, 29, who is said to have posed as a physician and to have stolen large quantities of narcotics from a score of drug stores, is today awaiting prosecution on charges of burglary and violation of the Narcotic Act. Deputy Sheriffs Brooks and McDermott, who arrested McBride, allege he posed as a doctor and thus was permitted to go behind drug-store counters in order to write "prescriptions." While behind the counters he would rifle the narcotic cabinet, the officers declare. McBride used this method,

it is charged, in the drug store of E. E. Busby at 3029 Whittier Boulevard, but was surprised in the act by the druggist. After a struggle Busby succeeded in holding McBride until Deputy Sheriffs Brooks and McDermott arrived.—*Los Angeles Record*, September 2, 1927.

According to the reports of our Investigation Department, M. James McGranaghan, licensed chiropractor, exonerated by the coroner's jury in September of last year in connection with the death of 6-year-old James MacManus, under anesthesia, and shortly thereafter charged with violation of the Medical Practice Act, was on August 18, 1927, held to answer by Police Judge Daniel S. O'Brien, pending trial in the Superior Court. The board holds that a licensed chiropractor has no authority to give anesthetics, we knowing of no chiropractic school which gives any instruction in anesthesia.

A citation has been issued calling Frank P. Moran, M. D., before the board at the October meeting to show cause why his license to practice in California should not be revoked, based upon a narcotic conviction.

A citation has been issued calling Milton A. Nelms, M. D., before the board at the October meeting to show cause why his license to practice in California should not be revoked, based upon a narcotic conviction.

A citation has been issued calling Ralph Newcomb, M. D., before the board at the October meeting to show cause why his license to practice in California should not be revoked.

According to a press dispatch dated Angels Camp, September 6, published in the *Stockton Record* of the same date, "Deputy Coroner John H. Carley filed a complaint in Justice C. H. McClory's court Saturday afternoon charging Dr. George F. Pache with refusing to appear as a witness at a recent coroner's inquest. . . . Sheriff Zwinge, who subpoenaed the doctor to appear at the hearing, reported to Coroner Carley that Pache refused to come, stating he would come when he got good and ready. . . . Pache appeared at the hearing after the inquest was over."

Daniel F. Royer, M. D., has been called before the board at the October meeting to show cause why his license to practice in the state of California should not be revoked, based upon his narcotic activities.

Our attention has recently been called to an advertisement of Willard Saulls in the *Los Angeles papers*, relating "Cancers drawn out. No return. Ninety per cent successful. Booklet free. See or write Dr. Saulls, 728 South Hill." Just how this licensed chiropractor expects to "draw out" cancers is left to the imagination.

Complaint was recently filed in Brawley charging Remedios Salcida with violation of the Medical Act.

A citation has been issued calling John H. Seiffert, M. D., of San Diego before the board at the October meeting to show cause why his license to practice in the state of California should not be revoked.

Recent report alleges that William Shore, M. D., of Ventura, who was placed on one-year probation following his hearing at the June meeting of the board, is alleged to be sought by the sheriff of Ventura County on a charge of passing bad checks.—"News Items," February, March, July, and September, 1927.

An alleged doctor by the name of De Nelson Smith is now under trial in the courts of Los Angeles on a charge of administering poison to Peter R. Gonsett, a French-Canadian inventor.

